

ROADS AND STREETS

MONSTER
ANNUAL
HEAVY CONSTRUCTION

JULY 1951



Does two jobs on the double with TIMKEN® bearings

THE photo above shows the new Adams TraveLoader picking up a heavy windrow of material excavated for pavement widening strips on an Illinois state highway. Built by J. D. Adams Manufacturing Company, the Timken® bearing equipped TraveLoader picks up and loads any kind of windrowed material, such as sod, gravel, bituminous mix, or scarified black top. And it actually loads as it travels!

J. D. Adams mounts front wheels, kingpin, upper conveyor bevel gear drive and feeding mechanism bevel gear drive of the TraveLoader on Timken tapered roller bearings. With Timken bearings at these vital points, the TraveLoader is assured long life, minimum maintenance, trouble-free service. Loads are handled faster, with less wear on moving parts.

Timken bearings' true rolling motion plus an extremely smooth surface finish make friction negligible. Line contact between rollers and races gives extra load-carrying capacity. Tapered construction enables Timken bearings to take any combination of radial and thrust loads; moving parts are held in proper alignment.

Timken bearings permit tighter clearances that keep out dirt and moisture, keep lubricant in. Maintenance time and

material costs are cut to a minimum. And because they are made of Timken fine alloy steel, Timken bearings normally last the life of the machine.

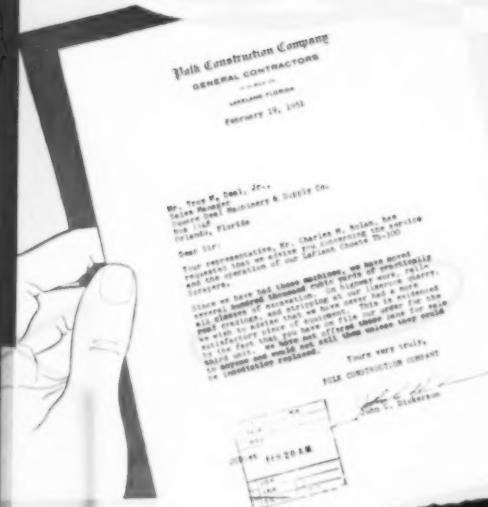
You can get all these advantages by specifying bearings with the trade-mark "Timken" whenever you build or buy. They are backed by over 50 years of bearing research and development. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



"We have never had a more satisfactory piece of equipment"

**LaPLANT-CHOATE
MOTOR
SCRAPERS**



• LIKE the boys at Polk Construction Company —you want *satisfactory performance* from your earthmoving equipment.

What does "satisfaction" mean?

It means the capacity to haul bigger payloads each trip . . . speeds that let you make more trips per hour. It means power to spare in the toughest going . . . power that's *useable* in the pit, on the haul road, on the fill. It means dependability . . . the ability to keep up the pace shift after shift.

In a word, "*satisfactory equipment*" means LaPlant-Choate Motor Scrapers!

Your LPC distributor can give you facts and figures on Motor Scraper performance . . . see him before you bid on your next job. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

On this Polk Construction Co. job at Minneola, Florida for the State Road Dept., yardage ran over 300,000 cubic yards. Part of the job included clay stabilization work with hauls up to 5 miles one way. With heaping 14-*yd.* payloads, the Motor Scrapers made the 10 mile load-haul-spread cycle at an average speed of 14 mph!

LA PLANT  CHOATE



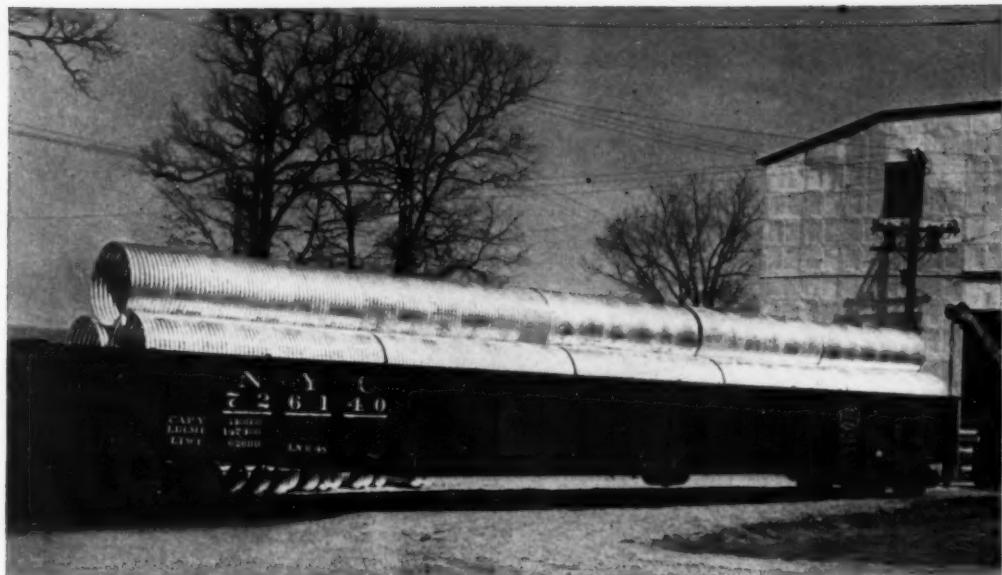
Cable-operated Scrapers in 6-, 8- and 14-*yd.* sizes for all makes of track-type tractors.



3- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.



GALVANIZED STEEL CULVERTS

Do the Job at Lower Cost

Culvert pipe made of copper-bearing galvanized steel does a superior job in highway and airfield drainage systems. It has much better resistance to corrosion—it has considerably greater strength—it has a slightly higher modulus of elasticity—and it costs less than culvert pipe made of other commonly used metals. Furthermore, pipe of this material is easy to handle and simple to install.

Bethlehem does not fabricate culvert pipe, but it does manufacture high-quality Beth-Cu-Loy galvanized steel stock used by culvert pipe fabricators. This steel more than satisfies the minimum specifications for culvert material set up by the American Association of State Highway Officials. It carries a tight, 2-oz zinc coating that satisfies the diagonal triple-spot tests.

Bethlehem furnishes this sheet stock both flat and corrugated in gages from 8 to 16, inclusive. Lengths range from 60 in., minimum to 156 in., maximum.

If you are bidding on any kind of drainage job, it will pay you to find out more about culvert pipe made of Beth-Cu-Loy galvanized steel. Write or phone any of our sales offices for complete details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Beth-Cu-Loy GALVANIZED Culvert Sheets

When writing advertisers please mention ROADS AND STREETS, July, 1951

ROADS AND STREETS

July, 1951 • Vol. 94 • No. 7

Roads and Streets represents 59 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892

E. S. GILLETTE, Publisher

CCA

HALBERT P. GILLETTE, Editor-in-Chief

H. J. CONWAY, Assistant Publisher

In This Issue

Coming Articles

Big Turnpike Paving Job

How contractors are doing it on the largest, fastest asphalt paving job in history. Several feature articles in preparation by the R. & S. editors.

President's Traffic Safety Conference Report

Sorry this got crowded out of the July issue. How engineering solutions are being coordinated with the many problems of enforcement, accident reporting, traffic planning, etc.

Flagmen on Road Jobs

Every road contractor as well as highway department executive will be interested in a forthcoming summary of Minnesota's new flagmen regulations. Also coming: How 12,000 vehicles daily are being passed safely through a multi-lane Ohio concrete paving project—the contractor working new tricks to earn his traffic-control pay item.

Raising a Bridge

Part of a reconstruction along the Ohio River Road, planned to assure 365-day traffic despite floods.

A Tennessee County Finds Real Economy in Soil-Cement

Soil cement base construction methods, unit costs, and service under traffic, reported in an early issue.

Snow and Ice Control

Several articles immediately ahead.

Edens Parkway Opens.

This expressway link Northwest of Chicago represents latest in "all-out" limited access design and construction. Pictorial story planned.

Who's using Radiotelephone?

A committee report will summarize data on radio's fast gaining acceptance as a highway department management tool.

HAROLD J. McKEEVER, Editorial Director
C. T. Murray, Managing Editor
Col. V. J. Brown, Associate Editor
W. W. VanStone, Production Editor

Acceptance under Act of June 5, 1948, Section 3464 P.L. & R. Authorized April 16, 1948, at Mount Morris, Illinois. Published monthly.
Subscription price \$5.00 per year.

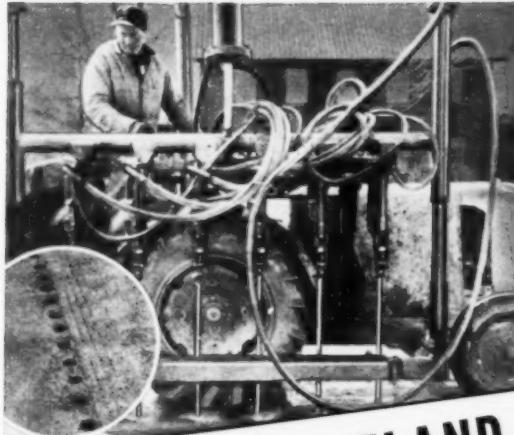
	Page
Scrapers Mingle with City Traffic on Earthmoving Job.....	35
Integration Is Key to Texas Traffic Safety Program.....	38
By Fred T. Bennett, Engineer of Traffic Services, Texas Highway Department	
Michigan Overhauls Its Road Legislation (Editorial).....	41
International Road Federation and "Point 4" Plan Joint Program.....	45
"Job and Equipment Ideas" Department.....	46
The Angle Prism and Its Application to Highway Surveying.....	48
By H. S. Wahlen	
How Army and Navy Defense Construction Contracts Are Handled.....	50
BITUMINOUS ROADS AND STREETS	
Cover or Frontispiece.....	59
Contractors Help Repair Ohio's Spring Road Damage.....	67
Heavily Traveled N. Mexico Road Repaved with Hot-Mix.....	72
By Ira B. Miller, New Mexico Highway Department, and J. D. Reese, The Texas Company	
Asphalt Research in California.....	76
Patrols Compared with Maintenance Crews.....	77
John C. Burnham, Maine State Highway Commission	
Control of Hot-Mix Asphaltic Concrete.....	80
By J. Roger Martin, Research Professor of Civil Engineering, Texas A & M College	
Kentucky Changes Bituminous Test Procedure.....	85
Early Patching Helps New York Roads Through "Worst" Spring.....	86
Reducing the Hazards of Electrical Blasting.....	91
Water-Filled Pneumatic Tires Aid Mower Efficiency.....	94
New Equipment and Materials.....	96
With the Manufacturers and Distributors.....	103
Manufacturers Literature.....	104
"Clearing House" Section.....	111

A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

GILLETTE PUBLISHING COMPANY

Publication and Editorial Offices
22 West Maple Street, Chicago 10, Ill.

Chicago Office..... S. A. Phillips, Sales Manager, 22 W. Maple St.
R. T. Wilson, Mid-West Manager
M. B. Nyland, Western Manager
E. Bender, Clearing House Manager
L. A. Conway, Advertising Editor
New York Office..... H. D. Crippen, Eastern Manager, 155 E. 44th St.
F. A. Michel, Jr.
Cleveland Office..... Lee B. McMahon, Manager, Leader Building
Western Office..... J. A. Osborne, 1126 Del Ray, Pasadena 8, Calif.



Multiple Drill Rig for Line-drilling

This self-propelled rig has saved hundreds of dollars for contractors everywhere. It consists of 6 Le Roi-CLEVELAND H10 drills mounted on a Le Roi Centaur Tractor. All drills are attached to a single air cylinder controlled from the driver's seat, and feed into the concrete or pavement together. The rig is ideal for line-drilling and the web between the drill holes can be broached easily with Le Roi-CLEVELAND paving breakers. That's how it provides a fast, low-cost method of preparing pavement for trenching. Freedom from over-break permits clean, smooth resurfacing when job is finished.

**Le Roi-CLEVELAND Announces
3 New Air Tools
for Contractors**

*...they save work, cut costs, and help keep
jobs on schedule*

1

18-lb. H22 Hornet Rock Drill

Handcrank or ...

2

**Model DR34
Light Wagon Drill**

... air motor
for fast, easy
adjustments



18-lb. H22 Hornet Rock Drill

Handy is the word for this new tool. Available with spade or tee handle in wet or dry types. Fast drilling, easy holding, strong rotation, low air consumption, built-in lubricator, replaceable spacer bushing, 2-piece chuck and sleeve for $\frac{7}{8}$ " hex x $3\frac{1}{4}$ " steel. Built like a big rock drill. Ideal for foundations, demolition, plumbing, sewers, conduit, pop-holing, dimension stone, etc.

Here's a truly lightweight wagon drill. It's ideal for quarries, road jobs, mining — every highway department should have one. Can be supplied with 2 sizes of rock drills — either the famous Le Roi-CLEVELAND 45-lb, H10 or the 80-lb. H23 with $3\frac{1}{8}$ -inch bore. Feed action furnished by patented 2-in-1 air feed cylinder. 7-foot feed travel gives you 6-foot steel changes. Conveniently located controls permit selection of right feed pressure for highest drilling speed in any kind of rock. Strong, direct blowing easily cleans 20-foot holes. You can drill at practically any angle — toe holes with machine 4 inches from ground or flat holes $7\frac{1}{2}$ feet from the ground. Adjustments are easily and quickly made by either hand crank or air motor.

No matter what your drilling job is — you can do it better, faster, for less with Le Roi-CLEVELAND rock drills and breakers powered with Le Roi Airmaster Compressors. Write for complete information or see your nearby Le Roi distributor.

RR-42



LE ROI COMPANY

CLEVELAND ROCK DRILL DIVISION

12500 Berea Road, Cleveland 11, Ohio

Plants: Milwaukee • Cleveland • Greenwich, Ohio

MACK TRUCKS

See You Through

• There are many good reasons why a Mack is your best truck investment during times like the present. Most important of all is the undisputed fact that Mack trucks outlast them all.

This means that with a Mack truck you can face the uncertainties of the future with assurance...confident that even if trucks should become hard to replace your Mack will see you through...that it will stay on the job delivering dependable service mile after mile and year after year.

Thousands of truck users in World War II found out by actual experience that they were indeed "Lucky to own a Mack." Whatever the future may bring, you'll find that for a sound investment in long-term reliability and operating economy there's no other truck to match a Mack.

Your nearest Mack branch or distributor will give you the full story on what "Built Like A Mack" means in *extra* long life, *extra* strength and stamina, *extra* performance and *extra* dependability.

In punishing contracting service Mack trucks "see you through" with long-lasting dependable operation. This Model LJ six-wheel Diesel Mack serves D'Addario Contracting Co. of Bridgeport, Conn.



...outlast them all

MackTrucks, Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N.J.; Long Island City, N.Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.



B.F. Goodrich



These tires carry 95 tons over crushed limestone—with ease!

HAULING heavy loads over jagged rock in all kinds of weather calls for tires that can really "take it." Yet this is an everyday occurrence for these B. F. Goodrich Rock tires. The BFG's shown here are used on vehicles that haul limestone and shale from quarry to plant. The total load is 190,000 lbs., of which 88,000 lbs. is pay load.

B. F. Goodrich tires can give this kind of service because they are built to stand up under the most hazardous quarry and construction hauling conditions. For added protection, the pat-

ented *nylon shock shield* is built into all B. F. Goodrich tires of 8 or more plies. Extra strong, elastic nylon cords are placed between the tread rubber and the cord body. Under impact, these cords work together, absorbing and distributing the shock evenly. The shock shield protects against bruises and means more recyclable tires as well as longer service. Here is a construction advantage which is found only in BFG tires—and at no additional cost.

B. F. Goodrich tires are also available in all-nylon construction. For these or

any off-the-road tires see your BFG dealer. Or write for additional information on these tires that do a better job at lower cost. *The B. F. Goodrich Company, Akron, Ohio.*





Are you satisfied with your present hand labor costs? If you're like most construction men, your answer is probably an emphatic "NO"!

Hand labor is expensive—because it's slow.

But that's *not* the situation when you put a Gradall on the job!

The operator works with large tools, quickly changed for each particular job. He moves large quantities of earth rapidly, with such precision that clean-up hand labor is practically eliminated.

And the Gradall works in "tight" places inaccessible to other machines. Mounted on a 360° turntable, its telescoping boom "reaches out", twists and turns like an arm, to do its work in confining areas not much larger than the Gradall itself. And it's always "ready to go"—ready immediately to be driven to the next job at truck speed.

Cut your construction costs on many jobs, such as trenching, excavating, ditching, backfilling, grading, and pavement removal. Arrange a field demonstration with your Gradall Distributor today.

**Gradall Distributors in over 60 principal cities
in the United States and Canada**



GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE

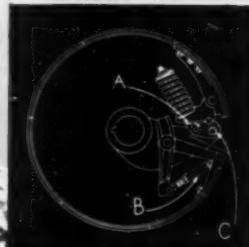
ELIMINATE THE SHOCK OVERLOADS

NORTHWEST
ADVANTAGES
MEAN LOWER
OPERATING COSTS

BEFORE THE
DAMAGE
IS DONE!

Protective devices at this point (between the engine and operating machinery) act after the shock load has passed through shafting and gearing. The Northwest Cushion Clutch catches the overload caused by the inertia stored in the rotating parts ahead of the engine.

The Cushion Clutch is a simple, positive device. The joint at "A" remains closed until overload point is reached. An overload causes the joint to open through the driving pin "C" and the clutch slips enough to cushion the shock of the load. The clutch is adjusted by the turnbuckle "B". There is no other adjustment.



● THE Northwest
Cushion Clutch in the
Main Drum Clutch
eliminates *shock overloads*
before the overload
reaches the machinery, not
after they have been carried
through the machinery with
resulting strain and possible
damage.

The Northwest Cushion Clutch reduces overloads on the drum shaft and associated parts. It results in reduced frequency of adjustments. It lengthens machine life and puts money in your pocket by reducing wear and tear.

NORTHWEST ENGINEERING COMPANY
1504 Field Building, 135 South LaSalle Street
Chicago 3, Illinois

Your Northwest is a real
Rock Shovel and if you have
a real Rock Shovel you never
have to worry about output
in any other kind of digging.

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



Grand Champ

Carroll Brown's big red TD-24 wins out on Colorado's "toughest road construction job ever!"

This summer, tourists welcomed the new wonder highway to the gleaming trout lakes atop Grand Mesa. But the men who built it called it "The Snake Pit"—a two-mile-high inferno of falling rocks, dynamite-proof basalt, and even prehistoric ice on the high north slopes where the sun never shines.

They had to clear out 300,000 cubic yards of snow before they could start building. They could work only from June to October each year—and they had to make a two-hour trip to the job each day because the air on Grand Mesa was so thin men couldn't stay at the job site.

It took five years and a million dollars to build six miles of highway—nearly a year and two hundred thousand dollars a mile. Carroll Brown, of the Brown Construction Company, finally finished

the job with flying colors, and he came up with this conclusion:

"On this most difficult project our company ever tackled, under the severest conditions we ever encountered, the International TD-24 tractor definitely outperformed all competitive equipment."

Once again the big red crawler had proved itself the Champ. The Champ for tough, dogged, never-give-up guts—148 maximum horsepower at the drawbar, 8 speeds forward, 8 reverse, Planet Power Steering with finger-tip control.

Ask your International Industrial Distributor for the real low-down on the TD-24. It's backed by complete parts supplies and service facilities for the hard-working years ahead. Get the whole story. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



INTERNATIONAL

POWER
THAT PAYS



of Grand Mesa

TWO MILES HIGH on Grand Mesa, an International TD-24 does more rock with more speed on new million-dollar highway. Volcanic rock, dense-grained basalt proved a pushover for the big red Champ.

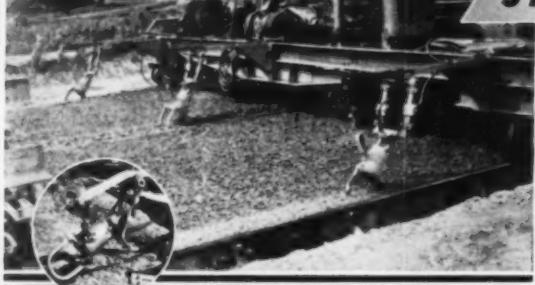


FOR LARGER PROFITS and BETTER RESULTS
IN EVERY PHASE OF CONCRETE PAVING!



HIGHWAY and AIRPORT

JACKSON VIBRATORY
PAVING TUBE



JACKSON SIDE FORM
VIBRATOR

Eliminates manual vibrating of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher, Jackson Vibratory Paving Tube or Spreader. Employs two or more vibratory units which are simultaneously lowered into or raised from the concrete by the finisher operator. Units operate close to forms or reinforcement, ride over any obstruction without fouling. Will not penetrate into sub-base. Assures thorough compaction regardless of speed of finisher, no spots missed. Long-wearing, trouble-free. Write for complete facts.

MUNICIPAL PAVING - BRIDGE DECKS
HIGHWAY WIDENING and PATCHING, etc.

JACKSON VIBRATORY
SCREED

Strikes off to any crown, undercuts at curb or side-form, works right up to and around manholes and other obstructions. With it center joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant. Most productive, most versatile of all screeds. Write for details.

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON --- MICH.

VIBRATORS for every type of concrete
construction FOR SALE or RENT at your
Jackson Distributor.

Your strong right arm...

in time of need



BECAUSE of the vast defense mobilization program, material shortages and extra production demands have gripped the nation. They affect particularly the heavy industries and the distributors and users of their products. And huge as America's facilities have become in recent years, they still are not large enough to keep pace with both military and civilian needs.

Nevertheless, as an owner of "Caterpillar" products, you are among the more fortunate. Your "Cat" equipment has been built for long life and to withstand severe working conditions. What's more, it is backed by a dealer organization that is world-famous for experience, accessibility, mechanical facilities and field service to keep you going "come hell or high water."

Since World War II, the already large number of "Caterpillar" sales-and-service establishments has increased greatly. Also since that time, "Caterpillar" and its dealers have developed new techniques for restoring and extending the life of "Caterpillar" products. Today, in their own shops, "Caterpillar" dealers can *rebuild* a great many worn or damaged parts which formerly required completely new replacement. In short, every dealer is richly acquainted with scores of modern ways and means for

keeping your machines in good working condition. You can help by doing this:

Take your maintenance problems to your "Caterpillar" dealer BEFORE parts are worn beyond repair

Remember that excessively worn parts can cause damage to mating parts; that track parts, pistons and liners, crankshafts, cylinder heads, radiators and other items usually can be salvaged. Your problems are your dealer's problems. Go see him today. He'll do everything in his power to keep your machines operating. Your combined efforts will be reflected in longer equipment life.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES

TRACTORS

MOTOR GRADERS

EARTHMOVING EQUIPMENT

When you compare



KOEHRING COMPANY
Milwaukee 16, Wis.

Subsidiaries: JOHNSON • KWIK-MIX • PARSONS

measure by



"KOEHRING WORK CAPACITY"

**Ask your Koehring
Distributor for
specific information**



7 $\frac{3}{4}$ to 79 $\frac{1}{2}$ TONS lift capacity . . . $\frac{1}{4}$ to 2 $\frac{1}{4}$ yards dipper capacity

Here's Why **CHARLES**



See your *LeTourneau Distributor*
NOW for complete information

FRYSINGER bought 3 More D TOURNAPULLS



C. W. Frysinger, Columbus, Ohio contractor, bought a high-speed, rubber-tired D Roadster Tournapull especially for finishing sub-grade, berms and back-slopes on a 10-mile, 178,000-yd. stretch of U. S. Hwy. 30N in Crawford and Wyandot Counties. Put to work self-loading around poles and culverts, the versatile Roadster averaged 50 pay yards of topsoil, sand and silt hourly on 1200' one-way hauls through traffic. "It did a first rate job on this assignment," reports Mr. Frysinger.

"In 2005 hours ... 96% efficient

"We purchased our second D Roadster early in 1950, because again we had a lot of berm work," continues the Ohio contractor, who just bought his 3rd and 4th "D's" this spring. "The machines fit right into our program. Our first Tournapull now has 2005 hours on it and is 96% mechanically efficient."

At present, the "D's" are being used by Frysinger Construction Company to handle fine-grading, sloping, and berm construction on 6 miles of State Hwy. 18 between Tiffin and Republic, Ohio. The entire stretch is being widened 6 ft., drain-

age improved, and bad curves corrected. Approximately 58,000 cubic yards are involved. Hauls vary from 300 to 2000 ft. one-way. Here's typical performance:

On 1000' haul . . . 54 yds. hourly per unit

Self-loading in topsoil and clay, each 122 h.p. Roadster heaps 4½ pay yards in 45 to 60 seconds. Loading distance in shallow roadside cuts ranges from 75 to 85 ft. Haul, dump and return on a 2000-ft. cycle through traffic takes only 3½ minutes. Making a round trip every 4½ minutes, each Tournapull delivers 12 loads . . . 54 pay yards an hour.

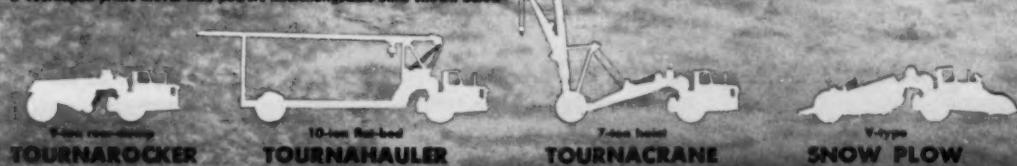
Average 25 m.p.h. job-to-job

Frysinger takes additional advantage of the rubber-tired "D's" speed and mobility by driving his rigs over main highways from job to job. Two Tournapulls made the 90-mile trip from Columbus to their present job at Tiffin in 3½ hours.

You'll find this versatile, 7-yd. (9-ton) D Roadster a time and money-saver on all your dirtmoving jobs, too . . . either as a self-loading, odd-job tool, or in fleet operation with a pusher. Ask your LeTourneau Distributor for job-proved facts and figures. Call him, or write TODAY.

VERSATILITY for extra profits

In addition to 7-yd. Garryowen Scraper, and front-mounted Bulldozer blade, D Tournapull prime mover also powers interchangeable units shown below:



LE TOURNEAU
TOURNAPULLS

PEORIA, ILLINOIS

FOR LOWEST NET COST PER YARD



what's YOUR headache.



ROCK ?

On an A-W Power Grader the bulldozer becomes a rough, tough tool . . . extra sturdy to match the extra power of ALL-WHEEL DRIVE, and fully up to this job of clearing a rock slide.



SAND ?

Live, climbing power at both ends of the machine keeps it bulldozing steadily through sand where an ordinary grader would find it difficult to travel, let alone work.



EARTH ?

On this railroad fill, there is plenty of power and traction to use both blades, with their fingertip hydraulic controls for quick and easy, precision operation.



TREES ?

First, the grader blade with its deep-plowing ability is secked into the ground to undercut the tree roots; then the bulldozer backed by the superpower of ALL-WHEEL DRIVE finishes the job.

The traction and maneuverability of A-W Power Graders make them ideal tools for the Bulldozing jobs found on grading and construction work. Heavily made and reinforced to accommodate the extra power of All-Wheel Drive and Steer, the Bulldozer is an essential for many jobs — a time and money-saver for dozens of others.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

Subsidiary of Baldwin-Lima-Hamilton Corporation

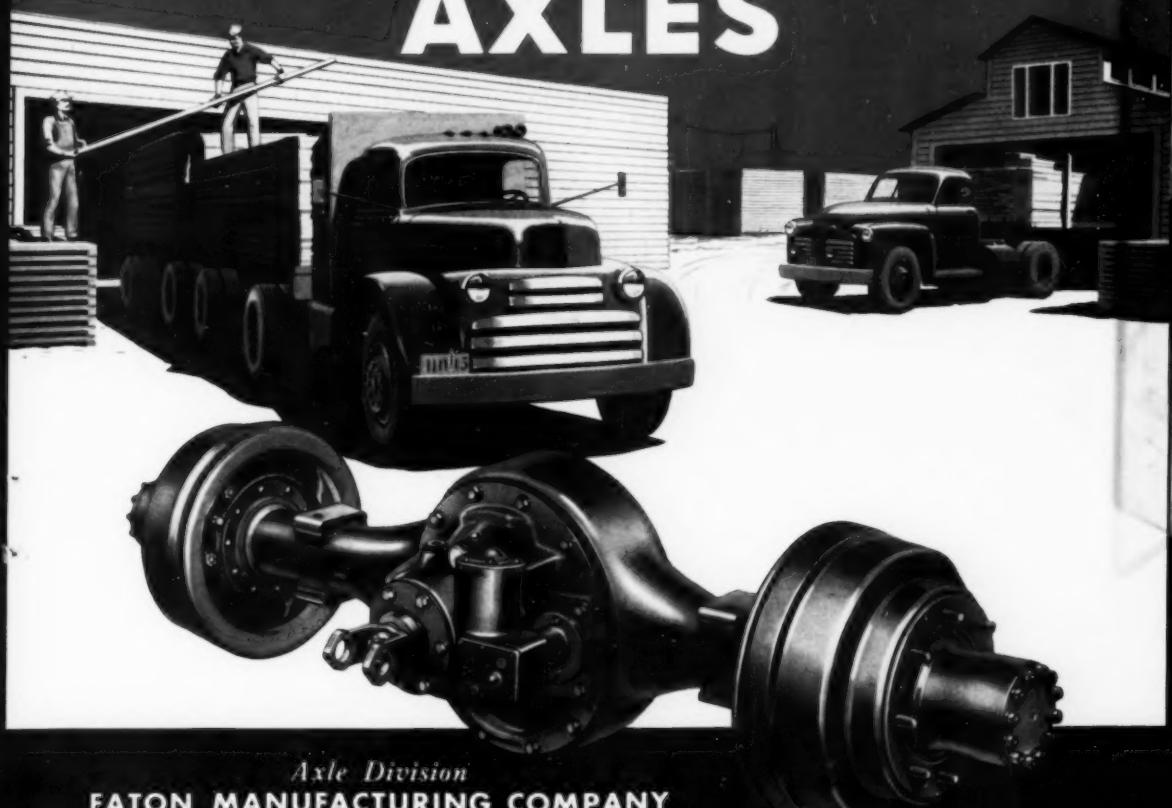


More Miles Per Day— More Miles in the Life of Your Trucks

Trucks with Eaton 2-Speed Axles "make time", not only on the open highway, but in city traffic as well. Even more important, Eaton 2-Speed Axles save wear-and-tear on engine and power transmitting parts; keep trucks in service, and add thousands of miles to vehicle life. Many exclusive features com-

bine to give Eaton axles long life with minimum maintenance cost. Planetary gears distribute loads over several gear teeth, dividing the stress. Positive lubrication, even at slow speeds, reduces friction wear. Ask your truck dealer to explain how Eaton 2-Speed Axles pay for themselves over and over.

EATON 2-Speed Truck AXLES



Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO



PRODUCTS: SODIUM COOLED, POPPET, AND FREE-VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRING TIGHTS • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMIC DRIVE BRAKES, DYNAMOMETERS

PRACTICAL BOOKS for PRACTICAL MEN

Books for Engineers and Contractors written by men who have had actual experience as contractors and engineers.

ROAD AND STREET CONSTRUCTION METHODS AND COST

By HALBERT P. GILLETTE and JOHN C. BLACK

Members, American Society of Civil Engineers

Records of actual costs and methods of construction on street and highway work. Fully indexed. Approx. 600 pages—\$6.00 plus postage.

ENGINEERING TERMINOLOGY

By V. J. BROWN, *Assoc. Mem. ASCE*, Director, *Caminos y Calles*

D. G. RUNNER, *Formerly Asst. Materials Engr., U. S. Public Roads Adm.*

A word or phrase in one branch of engineering may have an entirely different meaning in some

other branch. This book is offered as a step toward avoiding misunderstanding between the different branches of engineering, the public and other professions. It is arranged in dictionary form. Appendices include foreign language terms; symbols; abbreviations; weights and measures; conversion factors. 439 pages—\$4.00 plus postage.

GEOLOGY FOR CIVIL ENGINEERS

as related to Highway Engineering

By DELMAR G. RUNNER

Formerly Assistant Materials Engineer, U. S. Public Roads Administration

Rocks and Soils, and their characteristics, both physical and chemical, as well as their classifications and geographical distributions are discussed in such a way as to make this book particularly valuable for civil engineers and for engineering colleges. The chapters on material surveys, together with those on the petrographic microscope and its use constitute a real contribution to the fund of knowledge on engineering geology. 310 pages—\$5.00 plus postage.

ANY OF THE ABOVE BOOKS WILL BE SENT ON 10-DAY APPROVAL

Address: **GILLETTE PUBLISHING CO.**

22 West Maple Street

Chicago 10, Illinois

LOAD IT... MOVE IT... DUMP IT-



At LOWER COST with
Firestone TIRES

When you're handling big loads, speeding them out over your haul roads to dump . . . when you're doing this day in and day out in all kinds of weather, you have to have tires that can "take it."

Firestone Tires can take it, because they're made to take it, made with strong, Gum-Dipped rayon cord bodies . . . made with four extra impact plies to protect the bodies . . . made with double-thick, snag-resistant sidewalls . . . made with extra heavy treads engineered to fit the job.

Give Firestone Tires a trial on your equipment. You'll find that all along the line, trip in and trip out, they speed your work, cut your downtime, and boost your profits.

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES SPECIFY FIRESTONE OFF-THE-HIGHWAY TIRES

Enjoy the Voice of Firestone on radio or television every Monday evening over NBC

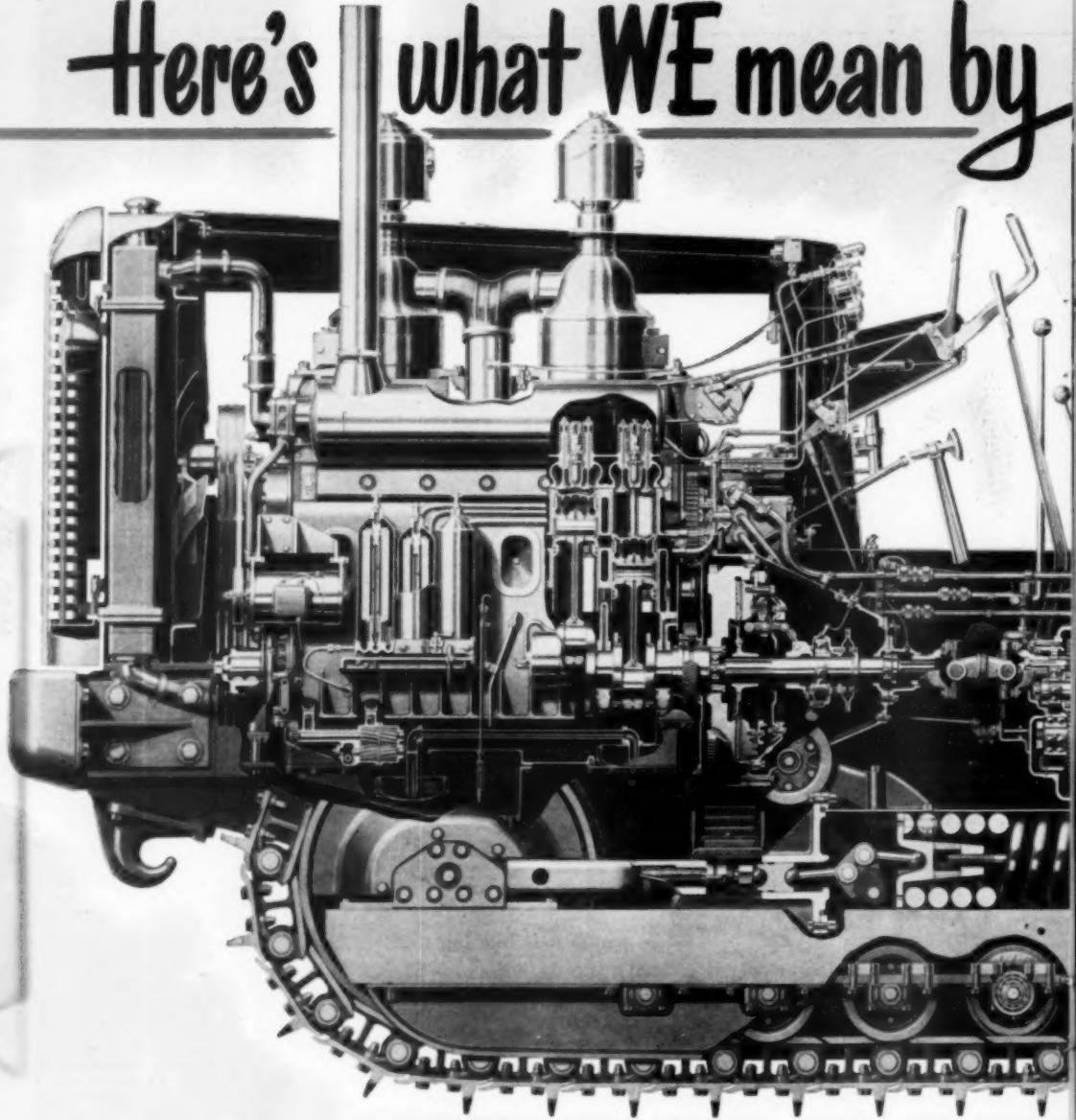
Copyright, 1951, The Firestone Tire & Rubber Co.

When writing advertisers please mention ROADS AND STREETS, July, 1951

19



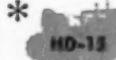
Here's what WE mean by



HD-5
40.26 drawbar hp.
11,250 lb.



HD-9
70 drawbar hp.
18,600 lb.



HD-15
102 drawbar hp.
27,850 lb.

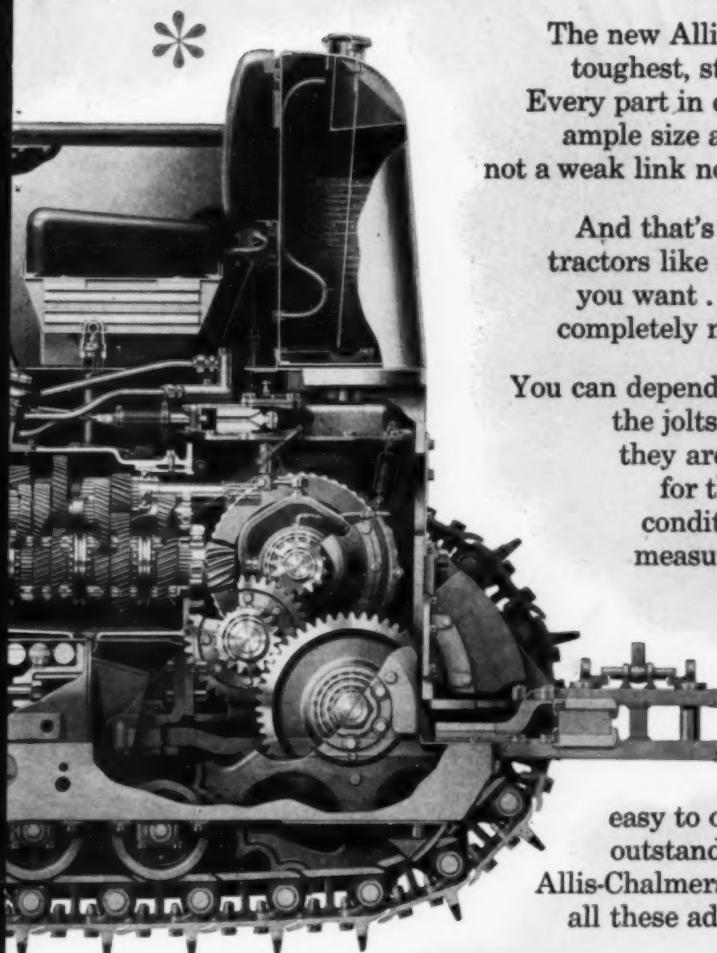


Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

The Newest, Finest Tractor Line on Earth!

• DESIGNED FOR YOUR JOB • BUILT TO TAKE IT • EASY TO OPERATE • EASY TO SERVICE

BUILT TO TAKE IT



The new Allis-Chalmers tractors are the toughest, strongest tractors ever built. Every part in each of the four models has ample size and strength to do its job—not a weak link nor a compromise anywhere.

And that's no accident! To bring you tractors like these . . . with the qualities you want . . . Allis-Chalmers built 'em completely new — from the ground up.

You can depend on them to take the loads, the jolts of today's jobs . . . because they are modern tractors designed for the most grueling operating conditions. They will more than measure up to your expectations!

Here are just a few of the many reasons why this **NEWEST, FINEST TRACTOR LINE ON EARTH** is *Built To Take It* . . . besides being easy to operate, easy to service and outstanding in performance. Your Allis-Chalmers dealer will gladly explain all these advantages . . . see him NOW.

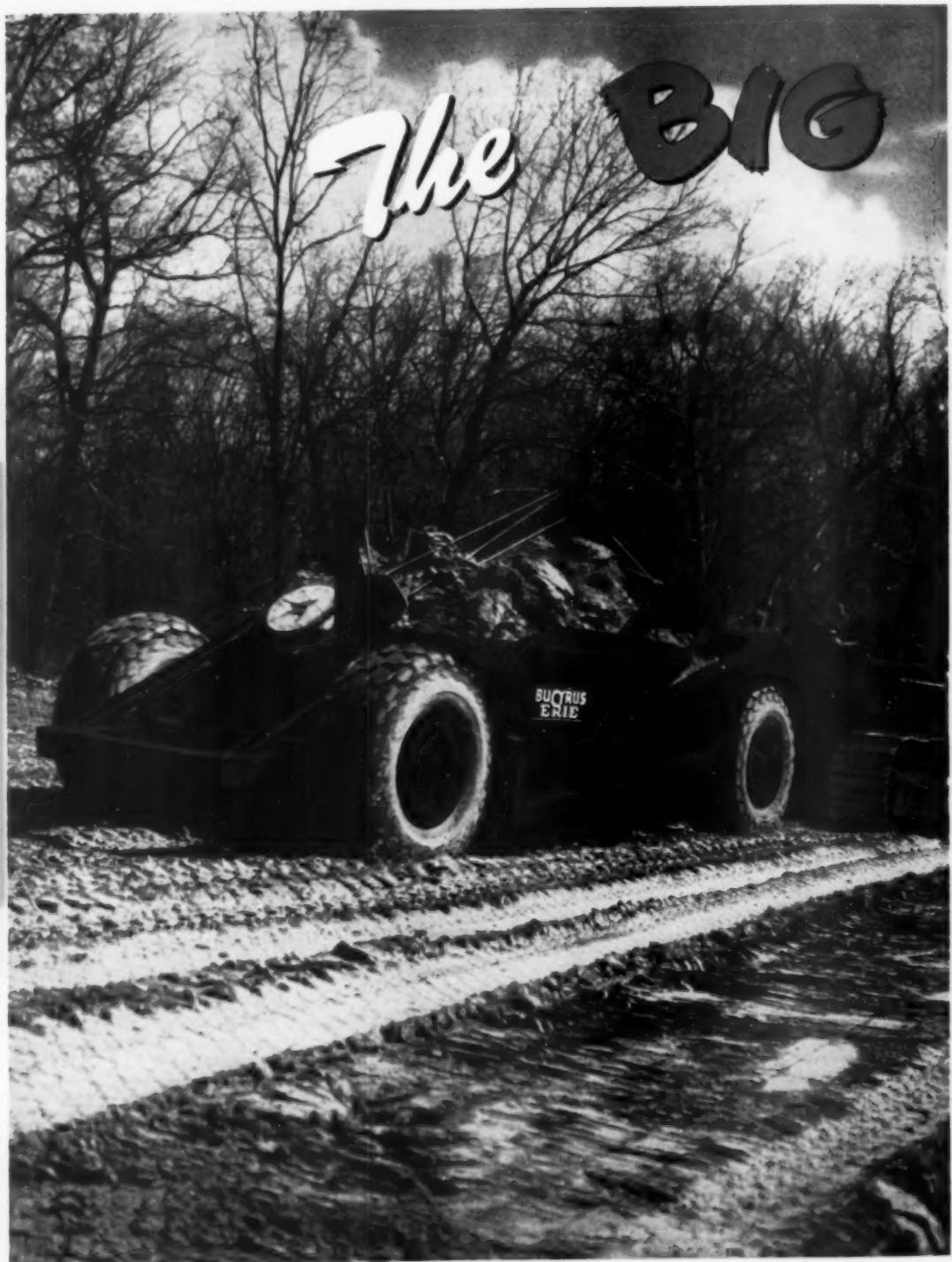
- All-Steel Welded Construction
- More Power with Bigger Engines — Longer Engine Life
- More Weight, Greater Strength
- Long-Lasting, Large Diameter Clutches

- Extra Heavy Main Frames — No Extra Reinforcement Needed for Front-Mounted Equipment
- Double Reduction, Straddle-Mounted Final Drive Gears with Live Sprocket Shafts and Caged Bearings
- Positive Operating Track Release —

- Works in Oil on HD-9, HD-15, HD-20
- All New, Specially Designed Track Assembly
- Positive-Seal Truck Wheels, Support Rollers and Idlers — Mounted on Tapered Roller Bearings. 1,000-Hour Lubrication!

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



RED TEAM

... Best at Every Distance on Highway Relocation Job

HANDLING 600,000 yd. of wet sticky clay put every tractor-scraper unit in the contractor's spread to a rugged test on this job. Both loading and unloading were extremely difficult, and hauls ranged from 300 to 2200 feet. Yet the Big Red Team — an International TD-24 and Bucyrus-Erie B-type scraper like the one pictured — outperformed, out-produced every other unit on every count.

Actual on-the-job performance showed that the Big Red Team delivered up to twice as much dirt as any other tractor-scraper combination. Its hourly averages were as high as 173 cu. yd. on the 350-ft. hauls — 118 cu. yd. on the 2000-ft. hauls.

The Bucyrus-Erie scraper is the pay-dirt member of the Big Red Team — perfectly matched to the TD-24 to take full advantage of its great power. Both B-type models, the 15-yd. and the 22-yd. (struck capacities), load quicker, dump faster and cleaner in any kind of material than any other scraper. See for yourself. Ask for a demonstration of the Big Red Team on *your* job as soon as possible.

2817810

SOUTH MILWAUKEE

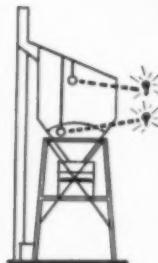
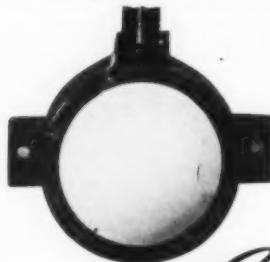
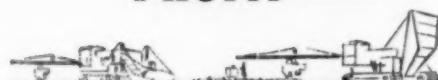
**BUCYRUS
ERIE**

WISCONSIN

See

**Your International Industrial
Tractor Distributor**

**TO POCKET
AN EXTRA
PROFIT —**



**EQUIP YOUR PLANT FOR
TOP PRODUCTION!**

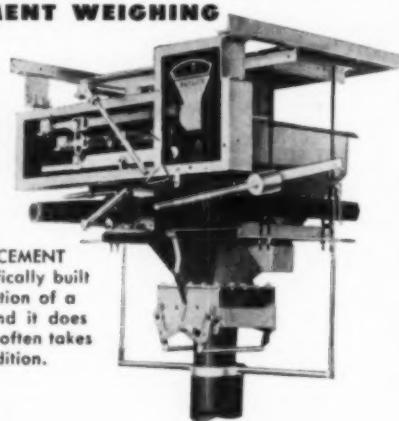
LITTLE THINGS can count up big in the profit column. Little things that keep your batchers running smoothly hour after hour — day after day; little things that save in costly, critical manpower.

As examples:

BUTLER Positive BIN LEVEL INDICATORS. They'll fit any make of plant; work with virtually any material. Sealed against moisture or dust. Practically indestructible yet sensitive as a violin. And absolutely POSITIVE in action.

BUTLER CEMENT WEIGHING BATCHERS

We hope you haven't—but if you have a bulk cement bin made by someone other than BUTLER you can still get the advantage of quick accurate batching by installing a BUTLER CEMENT BATCHER. It's specifically built to match the production of a dual drum paver and it does it so superbly that it often takes care of a 27E in addition.



Any of these you want more information on? Just a postcard will get our prompt attention.

Want to look over the best in Bulk Cement Plants? Ask for Bulletin 210. It's FREE!



BUTLER AIR JETS

Instant-acting, trouble-free, positive and durable. Worth their weight in diamonds when cement gets obstinate. Install them and activate them with the —

BUTLER CEMENT AERATOR

Nothing else like it. So compact it takes only the space of a standing man. Yet, everything's there — compressor, tank, motor and all controls — all in one neat package. There's a dual pressure take-off so you can use air for other applications. Flat tires, for instance.

BUTLER ELECTRIC VIBRATOR

A highly practical traffic-cop to keep cement from loafing in the batcher. And as a signal to your truck driver that the batch is complete it sends him off to a quick start, too.



BUTLER BIN CO.

959 BLACKSTONE AVE.

WAUKESHA, WIS.

ADAMS MOTOR GRADERS

give you big capacity + versatility + economy



★ If you want to know how good Adams Motor Graders actually are, just watch them do their stuff on really rough, tough jobs—the kind where brute strength and stamina, massive power and traction and high-speed flexibility are "must" requirements.

On big dam projects, for example, like the one above, Adams Motor Graders frequently work the clock around—cutting and spreading huge masses of tough, hard-to-manage material, building haul roads and then keeping them in fast travel condition for great fleets of heavy earth-moving equipment.

Whatever grading operations your work involves—from deep ditch cutting to high bank sloping—you'll find Adams Motor Graders have what it takes to do the job in fastest time, at lowest cost. No other machines handle so many jobs, so fast, so well—scarifying, sub-grading, fine finishing, mixing, back-filling, etc.

Ask your local Adams dealer for complete information on these great machines—or write for illustrated literature.

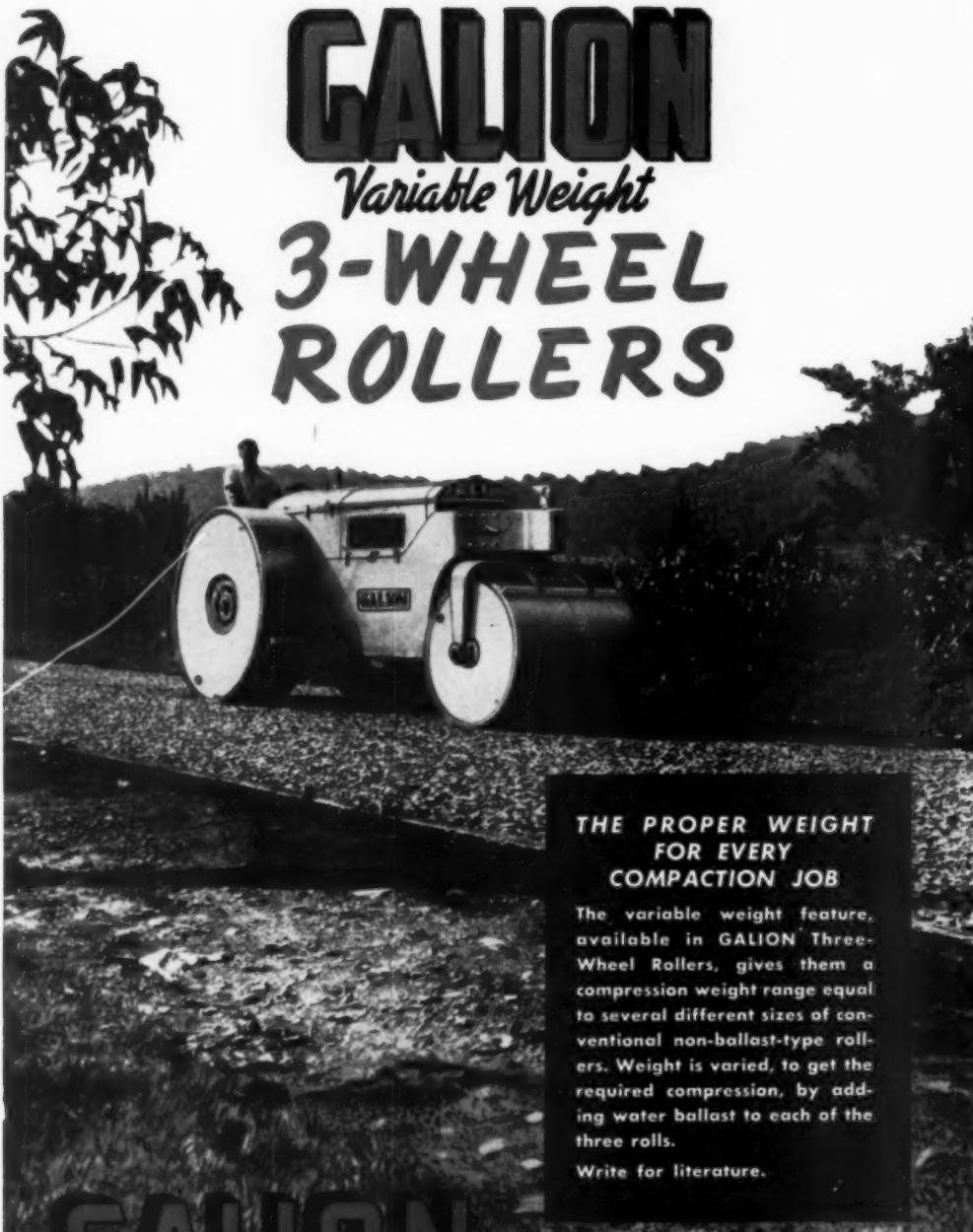
J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

Only Adams has this exclusive
combination of advantages

- **8 Overlapping Forward Speeds**...Flexible working range speeds work—increases output—provides high transport speeds.
- **Wide Range of Blade Positions**—Without Mechanical Adjustments...Saves Time in Adapting Machine to Needed Cuts.
- **Positive-Action Mechanical Controls**...Dependable, accurate adjustments—because they're geared...Easy, natural steering.
- **Ample Operating Clearances**...Quick, easy adaptation to work...Operator comfort, convenience, efficiency.
- **Fast, Easy, Servicing Plus World-Wide Dealer Service**...Saves time and money.

*Make your next
motor grader an*

ADAMS



GALION

Variable Weight

3-WHEEL ROLLERS

THE PROPER WEIGHT FOR EVERY COMPACTION JOB

The variable weight feature, available in GALION Three-Wheel Rollers, gives them a compression weight range equal to several different sizes of conventional non-ballast-type rollers. Weight is varied, to get the required compression, by adding water ballast to each of the three rolls.

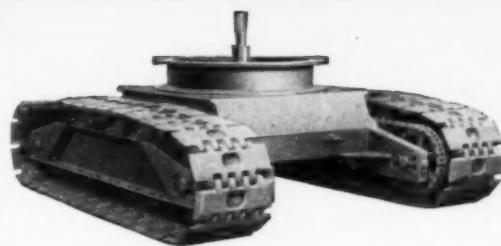
Write for literature.

GALION

ESTABLISHED 1907

MOTOR GRADERS • ROLLERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.
Cable address: GALIONIRON, Galion, Ohio



TOUGH AS A TANK!

**LINK-BELT
SPEEDER**

All-welded steel construction means extra strength without extra weight

POUND for pound, the Link-Belt Speeder all-welded frame is stronger than other types of structures. Box section construction adds still more strength, uniting the entire base in one rugged, yet flexible structure by means of unrestricted design. Resistance to impact and twist is greater.

Deep recessing and full enclosure of mechanism, flush bottom, and high ground clearance provide maximum protection and maneuverability. Field maintenance is simple and quick. In fact, in every way, Link-Belt Speeder all-welded construction is truly "tough as a tank."

LINK-BELT SPEEDER
CORPORATION

12,000-A

*Builders of the most complete line
of shovels, cranes and draglines
CEDAR RAPIDS, IOWA*

4 reasons why **SOIL-CEMENT** paving is expanding tremendously

The graph on the photo of a soil-cement road* at the right shows accumulated yardages of roads and streets paved with soil-cement since 1935, when scientifically controlled soil-cement paving was introduced.

As the graph indicates, soil-cement paving has soared in the last five years. There were 36,436,144 sq. yd. built from 1946 through 1950. That is more than twice the yardage built in the previous 11-year history of soil-cement paving. During that period (1935 through 1945) 16,823,014 sq. yd. were built.

There are four significant reasons for this amazing growth of soil-cement paving:

1. IT IS ECONOMICAL. Generally about 85 per cent of the required materials is soil on the site or nearby.

2. CONSTRUCTION IS FAST. Construction or maintenance crews quickly learn the simple operations of building good soil-cement pavement. Though scientifically controlled, the process is fast and easy. Experienced crews have built as much as a mile a day.

3. IT IS DURABLE. In all parts of the country—from 40°F. below zero to more than 100° and from arid regions to places exceeding 60 in. of rainfall a year—soil-cement paving has proved its durability through long years of service. Practically all of the soil-cement pavement built since 1935 is still in use, rendering dependable, all-year, all-weather service.

4. MAINTENANCE IS LOW. Wherever maintenance records have been kept the extremely low cost of maintaining soil-cement pavement has been demonstrated. Usually an occasional seal coat applied over the bituminous surface is the only maintenance required.

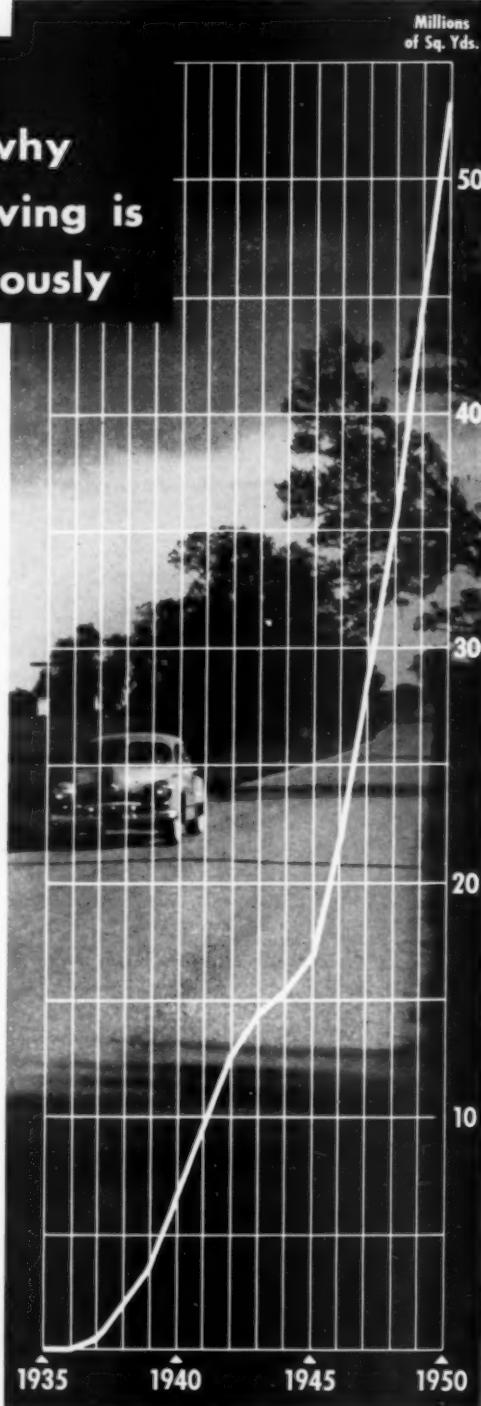
For more information about economical, durable soil-cement pavement write for free, illustrated literature. It is distributed only in the U.S. and Canada.

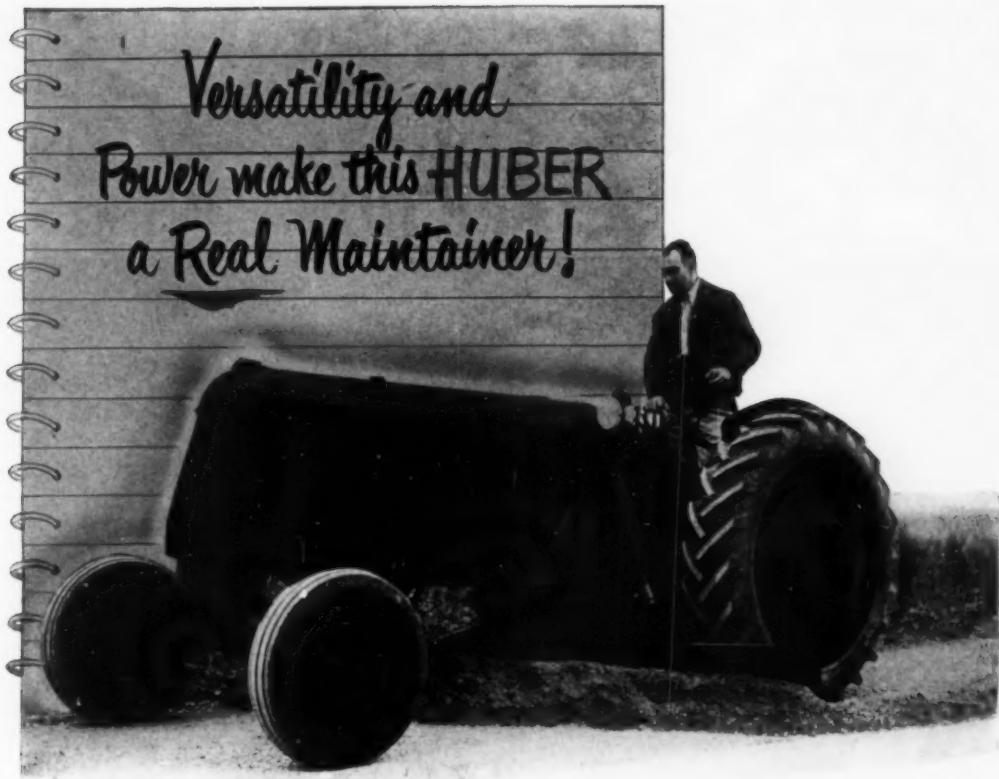
*Soil-cement pavement consists of a soil-cement base and a bituminous surface.

PORLAND CEMENT ASSOCIATION

Dept. A7-28, 33 W. Grand Ave., Chicago 10, Ill.

A national organization to improve and extend the uses of portland cement and concrete...through scientific research and engineering field work.





*Versatility and
Power make this HUBER
a Real Maintainer!*

Look at its versatility! Hydraulically controlled attachments quickly and easily convert it to bulldozer, lift loader, highway mower, berm grader, broom, road planer, patch roller or snow plow service.

Look at its power! . . . 42½ H. P.

Other important advantages: 1—The blade is PUSHED by Huber's exclusive modified A-frame design. Power is transmitted to the moldboard DIRECTLY from the driving wheels. The result: better traction, less power loss and more efficient use of the machine's 6000-pound weight.

2—The HUBER Maintainer gives you maximum work results and versatility in a single, one-man machine at modest investment and operating costs.

Get more for your maintenance dollars—your nearest HUBER Distributor will show you how.

HUBER

SINCE 1863



MANUFACTURING COMPANY • MARION, OHIO, U.S.A.

MANUFACTURERS OF HUBER MAINTAINERS, GRADERS AND COMPLETE LINE OF ROLLERS

When writing advertisers please mention ROADS AND STREETS, July, 1951



PERFECTION

Bridges 33 years of CONSTRUCTION PROGRESS



Thousands of trucks of all makes equipped with Perfection Hoists and Bodies have crossed this river over this bridge and others—helping to build the greatest city in the world.

Perfection Hoists and Bodies were on the job in 1918 — the start of the period of greatest development in construction and construction equipment in history. Records for size of structures and speed of completion continue to be made today.

Material haulage plays an important part in making these records — and PERFECTION leadership in truck body and hoist design is a vital part of this achievement.

That's why dealers and users know that where jobs are toughest—and where records are being made — there PERFECTION Bodies and Hoists will be found on the job. Write for literature.

Photo shows PERFECTION No. 354 Heavy-Duty Dump Body, length 192", width 96", capacity 16 cu. yds. PERFECTION "inside-braced" construction gives greatest possible capacity in relation to overall size of platform. Equipped with No. 1027 Iso-Hydraulic Roll-A-Lift.

PERFECTION
STAKE and DUMP BODIES
HYDRAULIC HOISTS



FOR ANY TRUCK
STANDARD or SPECIAL UNITS
IN ALL SIZES • FOR ANY USE

Engineered and Manufactured by
THE PERFECTION STEEL BODY CO.
Galion, Ohio, U.S.A.



"I truck 8 tons of sand for less than 4½¢ a mile!"

Ulmer says, "On tough jobs my F-7 Ford Truck with POWER PILOT is economical, and I also get all the power I need."

Ulmer was one of 5,000 owners who entered the nationwide Ford Truck Economy Run. He kept daily running cost records on his 1950 Ford F-7 Dump and reports: "My truck traveled 18,955 miles in rough going with an average load of 16,000 lbs. My running

cost expense amounted to \$825.30 for gas, oil, maintenance and repairs—that's a running cost of only 4.35 cents a mile!"

Like others who rely on Ford for low running costs, Ulmer is sold on the periodic, money-saving service he got from his local Ford Dealer. For more facts on the trucks that last longer and save you money every mile—mail the coupon below.



FORD TRUCKING COSTS LESS

because FORD TRUCKS LAST LONGER!

Using latest registration data on 7,318,000 trucks, life insurance experts prove Ford Trucks last longer!

When writing advertisers please mention ROADS AND STREETS, July, 1951

WISCONSIN
Report No. 7379

FORD TRUCK
ECONOMY
RUN

POWER PILOT helps CONSTRUCTION MEN hold down hauling costs

The Ford Truck POWER PILOT is a simpler, fully-proven way of getting the most power from the least gas.

• It automatically meters and fires the right amount of gas, at precisely the right instant, to match constantly changing speed, load and power requirements.

Unlike conventional systems, the Power Pilot uses one control instead of two, yet is designed to synchronize firing twice as accurately.

You can use regular gas . . . you get no-knock performance. Only Ford in the low-price field gives you Power Pilot Economy!

MAIL THIS COUPON TODAY!

FORD Division of FORD MOTOR COMPANY
3258 Schofer Rd., Dearborn, Mich.

Send me without charge or obligation, detailed specifications on Ford Trucks for 1951.

Full Line Heavy Duty Models

Light Models Extra Heavy Duty Models

Name _____ (Please print plainly)

Address _____

City _____ Zone _____ State _____



Better for paving work

Less mixing water is needed for a given slump with Atlas Duraplastic air-entraining portland cement.

The mix is more workable, more plastic, more cohesive and more uniform. It dumps, spreads and finishes easily. In addition, it permits finishing closer to the paver; gives earlier protection for curing.

Makes more durable concrete

Concrete made with Duraplastic is fortified against the effects of freezing-thawing weather. That's because Duraplastic minimizes bleeding and segregation; makes the concrete highly resistant to the scaling action of de-icing salts. (Below: Atlas Duraplastic

Concrete being poured for a section of highway.

Note cohesiveness and uniformity of mix.)



YET DURAPLASTIC* COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write
Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

ATLAS®

DURAPLASTIC
AIR-ENTRAINING PORTLAND CEMENT

Makes Better Concrete at No Extra Cost

NBC SYMPHONY SUMMER CONCERTS—Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—June to September

RS-0-127



OFFICES:

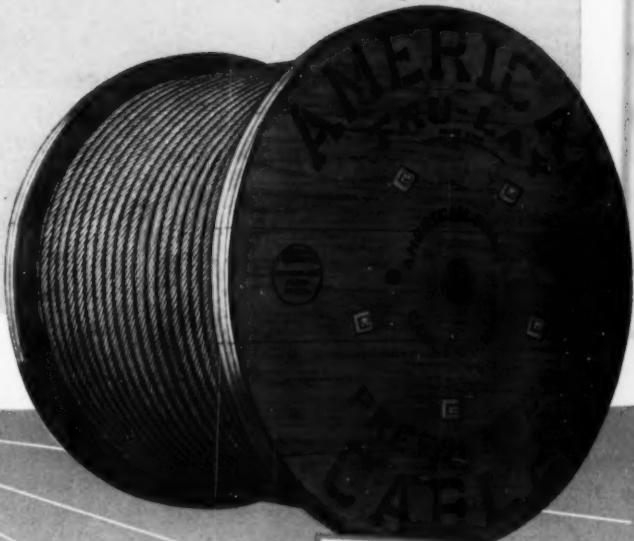
Albany, Birmingham,
Boston, Chicago, Dayton, Kansas City,
Minneapolis, New York, Philadelphia,
Pittsburgh, St. Louis, Waco.



TRU-LAY Preformed Wire Rope

- PERFORMS BETTER
- HANDLES EASIER
- SAFER TO USE
- LASTS LONGER

Available
through Distributors
ALL AROUND AMERICA



ACCO

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles,
New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN & CABLE
AMERICAN CABLE DIVISION



In Business for Your Safety

ALSO MAKERS OF THE
COMPLETE LINE OF
Registered
WIRE ROPE SLINGS

WEATHER OR NOT TEXACO MARFAK KEEPS YOUR MAINTENANCE COSTS LOW

ONLY 6 LUBRICANTS NEEDED

The Texaco Simplified Lubrication Plan for Contractors makes it possible to handle *all* your major lubricating needs with *only* six Texaco Lubricants. A Texaco Lubrication Engineer will gladly give you full information on this convenient cost-saving plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.



COME rain and mud, come blistering heat or freezing cold, *Texaco Marfak stays on the job*. Seals mud and dust out of chassis bearings. Protects against rust. And not even the heavy loads and rough terrain of construction work can jar or squeeze *Texaco Marfak* out of the bearings. No wonder chassis parts last longer, maintenance costs less.

In wheel bearings, *Texaco Marfak Heavy Duty* gives the same long-lasting protection. It guards bearings against wear and rust, and won't leak onto the brakes — an important

safety factor. Requires no seasonal change.

MORE THAN 400 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

For engine cleanliness, use *Texaco Ursula X***. It's fully detergent and dispersive, guards against harmful sludge and carbon, minimizes wear . . . reduces both maintenance costs and fuel consumption.

To protect crawler track mechanisms, use *Texaco Track Roll Lubricant*. It seals out dirt and moisture, wards off wear and rust.



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Scrapers Mingle with City Traffic

in 650,000 Yd. Road Raising and Hill Job at Cincinnati

Double-shift earthmoving schedule, with time out for rush-hour traffic, employed by contractors on Beechmont Avenue Extension project. New high-level flood levee to carry SR 74 & 125 and suburban traffic past Lunken airport

SCRAPERS carrying reduced loads mingled with traffic this summer along a section of SR 74 and 125 near Cincinnati's eastern edge. Working under a special permit from the city, the contractor is transporting 650,000 cu. yd. of earth across a city-owned viaduct for construction of a new high-level levee skirting the Ohio river bottomlands at Lunken airport.

This operation and an additional 200,000 cu. yd. of earthmoving is to be done without shutting down traffic at any time under contract terms which required approval of a traffic maintenance scheme as one of the pay items.

The project is the Beechmont Avenue extension, one of the largest current projects of the Ohio department of highways. Under a \$2,100,000 contract awarded in 1950 to Vest & Battell, general contractors of Cincinnati, a 1½-mile relocation of SR 74 and 125 will be built and this main highway to Mt. Washington and other eastern suburbs will be tied into Linwood Avenue at the city end. The job also involves a major bridge over the Little Miami River, and two interchanges.

New High Levee

The main roadway which will consist of a 4-lane divided concrete pavement will be carried on a new earth

levee for most of the length of the project. The new roadway will be approximately 7 ft. higher than the old, this raise being found necessary to top extreme floods of the Ohio River. The new levee will partially or completely envelop the old levee, as shown on the cross-section sketches, the new line gradually diverging from the old. Traffic will be maintained on all or part of the old roadway during the first phase of the levee construction, wherein the eastbound side of the new roadway will be completed and opened to traffic. As phase 2, the old roadway will be abandoned and the new E. B. roadway used for 2-way traffic while the remainder of the levee is completed and the new west-

bound pavement placed.

The new levee totaling nearly one mile in length is being filled entirely from a hill at the city-ward end of the job. Haul including crossing of an intervening railway grade separation viaduct, will average about 0.6 mile. The hill cut mostly in blue or yellow clay will have a maximum depth of 87 ft. Earthmoving has been sublet to J. H. Turpin Co., of Cincinnati.

The first part of the hill removal was accomplished entirely with self-propelled scrapers and a heavy push loader. Under a special permit from the city, these heavy off-road machines used the viaduct and the adjacent concrete paved 4-lane roadway of Beechmont Avenue as part of the haul road to the levee filling operation. A limit of 34,000 lb. gross load per front or rear axle was prescribed, under which the contractor computed the permissible payload for each ma-

★ In the midst of 15,000-a-day urban arterial traffic, note Caterpillar DW10 tractor with No. 10 scraper heading for the hill for another load. Sprinkler truck glimpsed at extreme left





★ Looking along the old levee-top roadway (right) and grading for new wider, higher levee roadway (left). Heil scraper bringing load from the 650,000 yd.-hill (seen in background).

chine used and the approximate level each operator was to load his pan to avoid overload. Payloads ranged from 9 to 12 cu. yd. loose measure for the various units.

Traffic Control Problem

Equipment employed during the early stage included one TD24 International push tractor, two Caterpillar No. 10 scrapers with DW 10 tractors, one "special" consisting of a LaPlant-Choate scraper drawn by a Caterpillar DW 10, and one Heiliner 500 self-propelled scraper. This limited fleet moved about 2500 cu. yd. per day (2 shifts) on 4000 ft. average haul, working under flag control.

Traffic control during this hauling was seen to be a major problem, since the count along this section of SR 74 and 125 averages about 15,000 vehicles daily. No hauling was to be allowed between 6 and 9 A.M. and 4 and 7 P.M. rush periods. Since this would mean a very short working day, the sub-contractor elected to work two shifts, his second shift being from 7 P.M. to 5 A.M.

After about 100,000 cu. yd. had been removed by the scrapers the contractor brought in a P&H 2½-yd. shovel and 6 to 8 large dump trucks, with the expectation of bringing production to about 8,000 cu. yd. per day to complete the hill cut.

A problem in connection with hauling over the street viaduct was that of keeping the pavement reasonably clean. Despite the under loading of pans, some spillage inevitably occurred and also some dirt dropped from tires and other parts of the

equipment. In order to control dust the contractor provided a gravity sprinkler truck which made frequent round trips over the haul route. As mud accumulated a slipperiness problem also developed, and the city of Cincinnati cooperated by providing street flusher service at intervals, with occasional use of a fire hose at the intersection where the scrapers left the cut. Later in the job the contractor expects to add a pump to his sprinkler and take over most or all flushing required along the job.

Additional equipment on hand as of

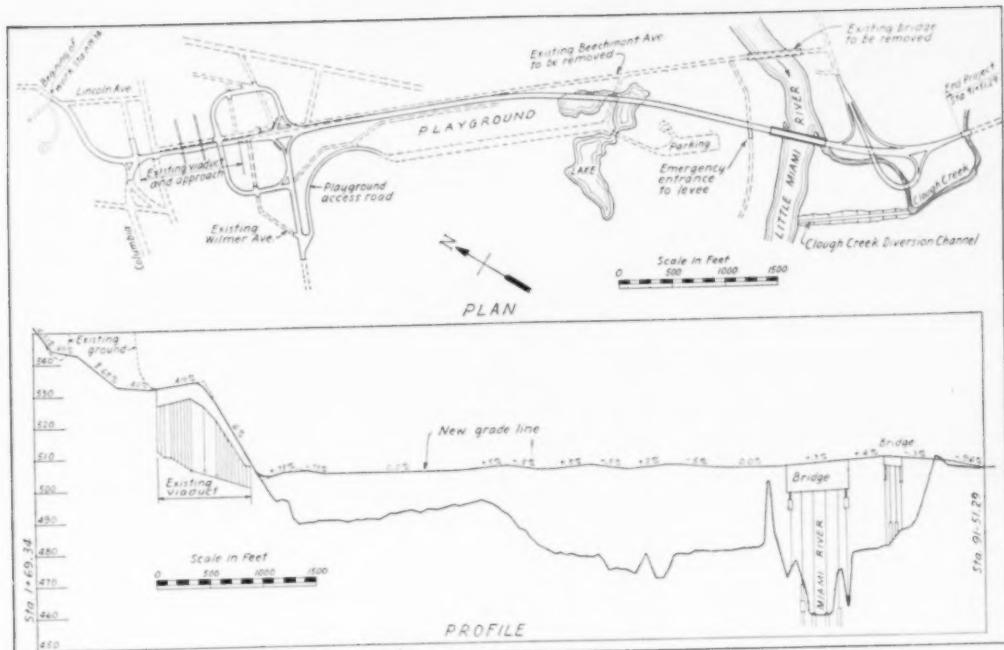
June 8 for levee compaction, interchange grading, channel changes and bridge foundation excavation included:

- 1 Galion motor grader
- 2 Bucyrus-Erie B-170 scrapers (12 yd.)
- 3 International TD24 tractors with Bucyrus-Erie dozers
- 3 Heil 500 self-propelled scrapers
- 1 International TD24 with Bros double-drum (4-ft.) sheepfoot roller unit
- 2 Caterpillar D7 tractors with double-drum (3-ft.) units
- 1 P & H 655B crane for driving bridge pier sheeting

An interesting minor problem en-



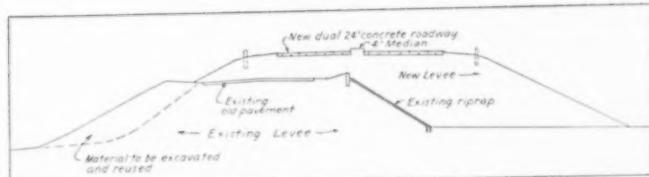
★ A creek channel change being excavated, as part of the relocation project. Equipment here: Bucyrus-Erie B-170 scraper, TD24 International tractors



* General plan and profile of Beachmont Avenue Extension, showing features referred to in article.

countered on the levee filling is that of draining and filling in several large ponds in the low ground adjacent. After borings showed the existence of gravel under the mud, these ponds were "punched out," i.e., holes are drilled into the gravel in an effort to bring about partial or complete subsidence by the time filling in is scheduled later in the summer. While draining the ponds would require no great pump capacity, doing so gradually in this manner offered a chance to dry the mud and thus avoid having to dredge excessively wet material.

The Beechmont Avenue project



★ Typical cross-section of old flood levees and new. Ohio specifications require special quality construction for embankments subject to inundation or exceeding 10 ft. in height.

when completed in 1952 will give S.R. 74 and 125 traffic streamlined roadway above all likely floods, and serve as a link in the federal-state-city-county expressway program for the Cincinnati area. The Ohio department of highways, T. J. Kauer, director, is represented on the job by Marc Korb, project engineer, with Prosper Russo, district construction engineer, and J. S. Paxton, division engineer of district No. 8 at Middletown.



★ This sign is standard along Ohio state road projects. An effective appeal

New Lubricant Developed By Armed Forces

A new grease that performs equally as well in tropic heat or Arctic cold has been adopted for use on all Army vehicles and artillery pieces. The Department of the Army said the all-temperature lubricant developed by the Army Ordnance Corps is expected

to simplify the Army's supply problem by replacing at least six different greases. Extensive tests over the past three years started with "Operation Greaseball." It involved a convoy of 12 Army trucks that left Aberdeen Proving Ground in 1948 and covered 20,000 miles of driving in varying climates.

Week-End Truck Ban Issued in Wisconsin

The Public Service Commission of Wisconsin again has issued an order to prohibit trucks over 8,000 lbs. gross weight from using principal highways during weekends for the period from May 29 until the second Sunday in September. Trucks are denied the use of these roads between the hours of 1 p.m. and 10 p.m. on Saturdays and 9 a.m. and 10 p.m. on Sundays or legal holidays.

LEGAL SPEEDS (EXCEPT IN ZONED AREAS)	
AUTOMOBILES (DAY)	60
AUTOMOBILES (NIGHT)	55
BUSES & TAXIS	55
COMMERCIAL VEHICLES	45
PLEASE DRIVE CAREFULLY	

★Informational signs are located at strategic points, giving legal speeds for different types of vehicles.

How all branches of the organization cooperate to do a unified job of building greater safety into Texas roads

By Fred T. Bennett

Engineer, Traffic Services, Texas Highway Department, Austin

THE Traffic Safety Program of the Texas Highway Department is an integrated one that extends from the top administrative level to the hourly employee in the field. It is a program based on sound, proved engineering principles, most of which are incorporated in the Action Program of the President's Highway Traffic Safety Conference of 1946 and the Texas Governor's Highway Traffic Safety Conference of 1947, and no claims can be made for new or startling innovations. The program can, however, claim the basic requisites of organization, coordination, planning, execution, and cooperation with other agencies concerned with the broad problem of automotive transportation.

It is fundamental that no program great or small can achieve any great degree of success without the coordinated efforts of an efficient, smooth functioning organization, and therefore it might be well to review the organizational plan which put the Traffic Safety Program into effect. For sake of brevity, only those units

having directly assigned responsibilities will be included, although the credit for any worthwhile accomplishment rightfully belongs to the entire organization.

Administration

The Texas Highway Department operates on a highly decentralized basis, primarily because the great area of the State makes this type of operation desirable for maximum efficiency. The skeleton or framework of the Department from a physical standpoint consists of the headquarters or Main Office at Austin, 25 District Offices including their resident offices at various points within the State, and Urban Project Offices in the four largest cities—Houston, Dallas, San Antonio, and Fort Worth.

The administrative control of all programs is vested in the State Highway Commission and the State Highway Engineer. It is from this level that the impetus for the Traffic Safety Program stems, for both the State Highway Commission and the State Highway Engineer have expressed conviction that the users of Texas highways are entitled not only to the best in highway design and construction but to efficient operation of the

highway system that will enable motorists to travel with a feeling of safety and convenience and a minimum of irritating delays.

Planning and Coordination

With the impetus gained from the top administrative level, the program moves into the planning stage of a two-pronged attack: namely, (1) new facilities which incorporate all the design principles of safety, and (2) making better use of existing facilities. The planning for the program of new facilities is primarily the joint responsibility of the Districts and the Road Design, Bridge, Land Service Roads, and Highway Planning Survey Divisions of the Austin Office, coordinated by the Chief Engineer of Planning. The planning for the program directed toward making better use of existing facilities is primarily the joint responsibility of the Districts and the Traffic Services and Maintenance Divisions of the Austin Office, coordinated by the Chief Engineer of Construction and Maintenance. When the final stages of planning are reached, the programs are of course returned to the Highway Commission and the Highway Engineer for final approval and allotment of funds.

Execution of Program

The final approval having been gained and the necessary funds provided for the programs, the way is

38

★(Left): Raised stripe consisting of asphalt seal coat with aggregate cover, placed on 2-lane pavement. Special machine used to build this economical strip, developed and long used by the Texas highway department. (Right): Texas striping scheme for 4-lane pavement



Integration is Key to

Texas Traffic Safety Program

then clear for putting them into effect. Design and preparation of plans for new highways are done in the District Offices, except for the expressway projects in the four largest cities. These expressway projects have their own engineering staffs. Close liaison is maintained with the District Offices by the Road Design, Bridge, and Land Service Roads Divisions through Senior Designing Engineers who make regular visits to the Districts for consultation on design problems. In the construction stage, the engineering supervision and inspection are handled by Resident Engineers and their assistants under the supervision of the District Engineers.

In the program of making better use of existing facilities, the activi-

ties are centered principally on the application of traffic control devices such as signs, signals, pavement markings, and channelization; on regulations such as speed zoning, marking curves with safe speed indications, parking restrictions and prohibitions, and one way operations; on investigations of high accident locations; and on rendering assistance to the smaller cities and towns with their individual



★Speed limit signs at limits of incorporated cities. Note ample size



★Curve warning signs with safe speed indications

traffic problems. The engineering design of these measures is the responsibility of the Traffic Engineering Section of the Division of Traffic Services, and most of the designs follow nationally approved standards. The actual work of applying these measures is carried out by the District Maintenance personnel. On municipal problems, the Division of Traffic Services furnishes the supervisory personnel for the studies, and



★(Above): Rural speed zone sign.
(Below): Urban speed zoning

the Districts and municipalities themselves furnish the personnel for collecting the survey data.

Program Accomplishments

Some of the major accomplishments of this two pronged program for the year 1949 which won third place for Texas in Engineering accomplishments in competition with the seven other largest States—California, New York, Michigan, Ohio, Pennsylvania, Illinois, and Indiana—are as follows:

1. **New Facilities.** The year's efforts produced these results in new facilities: (A) 2,204 miles of highways, 2,112 of which were 2-lane, 15 3-lane, 57 4-lane undivided, 13 4-lane divided, and 7 controlled-access express high-



★Typical intersection assembly—designed to eliminate the confusion common with grouped signs



★Over-size directional route marker and destination signs



★ "Before" and "After" changing from angle parking to parallel parking along an urban section of a Texas arterial route. Help move more traffic more safely



ways; and (B) 70 new bridges. Closely allied improvements involving capital expenditures included 587 miles of existing highways resurfaced and 225 miles of highways widened.

2. Making Better Use of Existing Facilities. The efforts directed toward making better use of existing facilities resulted in these accomplishments: (1) 5,790 miles of pavement marked with center lines and 7,035 miles of pavement marked with barrier stripes for no-passing zones; (2) curves good for speeds of 50 mph. and less marked with safe speed in-



★ Channelization of intersections is an important part of the Texas safety program



dications on 15,600 miles of highways; (3) 20,450 new traffic signs added and 69,600 existing signs replaced with new or reconditioned signs; (4) 591 studies made to determine need for traffic signals; (5) 15 fixed-time signals and 43 flashing beacon installations completed; (6) 20 miles of speed zones established; (7) 54 railroad-highway grade crossings protected with signals or gates; (8) 36 intersections channelized; (9) 414 problem locations improved; (10) 264 special traffic studies in municipalities.

Cooperation With Other Agencies

In spite of what might be considered a satisfactory degree of success within the realm of its legally delegated responsibilities, no Department can hope to realize the maximum achievement from its efforts without the fullest cooperation with other agencies, both public and quasi-public, when they too have a stake in the problem. The Highway Department is fully aware of this truth, and it works hand in hand with such agencies as the Texas Department of Public Safety, the Texas Department of Education, and the Texas

(Continued on page 92)



★ Stop sign installed swung overhead at intersection, as auxiliary to signs located at usual shoulder positions. (Lower scene) ReflectORIZED signs defining edge

Michigan Overhauls Its Road Legislation

Why Can't Your State?

The 23rd of May, 1951, marked a signal victory for highway progress in Michigan. On that day the Michigan Good Roads Federation program was enacted by the Legislature over the Governor's veto. The following summary, as described by Lawrence A. Rubin, Executive Director, Michigan Good Roads Federation, should make absorbing reading in other states—where unfortunately the legislatures have failed to agree on various road proposals, this year or last, while highways continue to deteriorate for lack of adequate funds, proper fund distribution, and modern administrative machinery.

IN 1946 the Michigan Good Roads Federation, comprised of highway users, administrators, builders and materials and supply men, became greatly alarmed over the obvious deterioration of the state's overall road and street plant. Rather than propose arbitrary increases in road revenues to take care of the disrepair accentuated by heavy war production traffic, the Federation directors decided to make an engineering analysis of deficiencies. They were determined to find out the extent of road needs, the cost of meeting them, a reasonable length of time for doing so. They decided to evaluate other pertinent factors such as highway administration, classification, financing and revenue distribution among the various road and street agencies.

"Needs Study" Organized

To make this engineering analysis, the Federation selected J. P. Buckley, now Chief Engineer, Highways Division, Automotive Safety Foundation, who was then completing a similar analysis for the State of California. Mr. Buckley, benefiting from his previous experience, organized Michigan's "Highway Needs" study. The Federation appointed six of its directors to comprise the Highway Study Committee. They represented the Michigan trucking industry, the Automobile Club of Michigan, state high-

way department, county road commissions, municipalities and the road building industry. These six men were responsible for the determination of policy in connection with Mr. Buckley's engineering efforts. Step by step, paragraph by paragraph, chapter by chapter, the Highway Study Committee passed upon and approved Mr. Buckley's work.

The State Legislature recognized the Federation's efforts and by resolution appointed a joint committee to counsel, advise and participate in the deliberations of the Highway Study Committee. Finally, in February of 1948, the report "Highway Needs in Michigan" was published.

Immediately the recommendations were boiled down to legislative proposals and finally into actual bills ready for introduction in the Legislature.

Originally the Federation's recommendations made it mandatory that state collected funds returned to road and street agencies for expenditure on local roads and streets be matched by those units of government. How-

ever, this mandatory matching requirement was eliminated. But the principle and intent of the Legislature was retained in that only limited state collected funds can be spent on "local" roads and streets. Any additional moneys therefor will have to be raised by the unit of government benefiting therefrom.

The Federation proposed that county road commissions confine themselves to matters of policy making and that members of the commission not be paid as wage or salary employees of the commission.

The Federation made no recommendation as to how much the gasoline tax should be increased, nor the car registration tax. It did, however, clearly stipulate how much additional revenues were required and that they should be raised from highway users rather than from the state's general fund. Experience has proved in Michigan that since 1930 appropriations from the general fund for highways were short-lived and were removed from the books within a year or two after their enactment.

Copies of this Remarkable Summary are Available

As part of ROADS AND STREETS' continuing editorial effort for highway advancement, this summary is being circulated to committeemen in the 48 state legislatures and in the Senate and House in Washington—as well as to the officials, engineers and contractors who administer and construct the nation's roads and streets. A few reprinted copies from our limited supply will be sent free on request. Larger quantities will be reprinted at cost for organizations desiring to circulate the article to newspapers, civic organizations and influential citizens in their states. If interested please write promptly to the Editor, ROADS AND STREETS, 22 West Maple Street, Chicago 10, Illinois.

Met First Rebuff

The Legislature in 1948 special session was expected to act upon these recommendations at that session. Kim Sigler, then Governor, indicated his willingness to "carry the ball for good roads in Michigan." However, the proponents of the good roads program were to meet their first rebuff when the Governor, conscious of his upcoming election six months later, adamantly refused, as was his constitutional prerogative in a special session, to allow the Legislature to consider an increase in the gasoline tax. In the final week of the session he did open up the discussion to an increase in truck taxes, but this obviously would not have provided sufficient funds to do the job and the bills then introduced died in committee.

It was then that the individuals closely associated with the engineering analysis "Highway Needs in

Highlights of Michigan's Sweeping Legislation, Result of a Sound

This sweeping overhaul affects administration, classification, finance and fund distribution. The Federation's entire recommended program was adopted virtually without change.

A basic bill provides for classification of all roads and streets in the state; establishment of a state motor vehicle highway fund, in which all state motor vehicle revenues are to be deposited; establishment of a new distribution formula for sharing of highway revenues; uniform accounting, and advance planning and programming of projects by all agencies participating in state revenues.

Additional revenues were provided in two bills increasing commercial license fees about \$5 million yearly, effective Dec. 1, 1951, and increasing the gasoline tax from 3 cents to 4½ cents and diesel fuel tax from 5 to 6 cents, effective June 1, 1951. The measures increase revenues about \$30 million yearly. Additional funds for construction from local sources

are expected in view of other provisions limiting state participation.

Other bills direct the state highway department to maintain all trunklines in municipalities, and allocate up to 40% of motor carrier fees collected by the public service commission for collection and administration and the balance to the motor vehicle highway fund.

The Good Roads Federation waged its campaign for classification on principles established in the state-wide survey, stressing the need for segregating arterials and access roads and streets. Such action, the Foundation said, would bring equitable distribution of cost and insure uniform, standardized administration, construction and maintenance, and long range planning based on relative needs.

The new laws permit the state highway commissioner, in the interests of better administration, to establish subordinate classification of the state trunkline highway system. Counties are required to establish system of primary roads,

composed of the most important routes, subject to approval of the state highway commissioner. All other roads are to be known as county local roads. Similar provisions are made for the incorporated cities and villages of the state, with designation of systems of major streets and of local street systems.

A change of far-reaching importance is the new and simplified distribution formula for motor vehicle funds, effective July 1. The old formula was a complicated patchwork, constantly amended with little regard for need or equity. Under the new program the state motor vehicle highway fund is distributed as follows on established needs: 44% to the state highway department, 37% to the county road commissions, and 19% to the incorporated cities and villages.

To meet deficiencies in urban areas, after operating expenses and maintenance, the state highway department must expend 40%

Michigan" fully realized how complex were their recommendations. From all corners of the state there arose criticism and complaints about the Federation's proposals and their impact upon individual county road commissions, cities and geographical areas of the state.

For example, many of the counties objected to the provision requiring the full time employment of a registered highway engineer. The northern part of the state objected to the new distribution formula inasmuch as it repealed the law requiring the state highway department to spend ¼ of its new construction funds in the Upper Peninsula and ¼ in the northern part of the Lower Peninsula. Cities, particularly the large ones, were in favor of the new distribution, but were lukewarm over the proposed increase in the gasoline tax.

Answered Local Critics

To answer local questions and objections, hundreds of speeches were made by Federation proponents in all corners of the state. It required correspondence with newspapers that literally ran into thousands of letters.

Then, when these basic criticisms

had been answered, there rose endless misunderstanding in connection with the formulas for distribution of funds to the individual counties and municipalities. When one stops to consider that 450 cities and incorporated villages ranging from populations of 200 to 2,000,000 must needs be satisfied tremendous burdens shouldered by the Michigan Municipal League in collaboration with the Federation in working out a distribution to all, which was still in line with street needs, and likely to be accepted by the Legislature.

The County Road Association of Michigan was faced with a similar problem in order to satisfy 83 county road commissions, likewise representing varying populations and economic backgrounds. Both of these efforts were complicated by the fact that past distribution had established a pattern which could not be erased in that no road agency would willingly accept a decrease in revenues. For this they can hardly be blamed, in view of rising costs and the fact that a tax increase would be imposed.

Throughout the remainder of 1948 and winter of 1949 proponents of the Federation program met with county

and city officials time and again until practically all criticism had been allayed. Yet no political leader arose to carry the Federation banner, and so long as the good roads program was identified with a tax increase, the only members of the Legislature willing to be identified with it were those from the less populous parts of the state. Consequently, in the 1949 session the program was bottled up in committee, where it remained.

Makes New Try

Following this legislative session, the Federation, its treasury depleted and its spirits low, came close to abandoning the program. Such a development would have been a serious blow to Michigan's highway progress. Not only were the Federation's proposals representative of good, sound highway legislation, but for the first time in the state's history all road interests were supporting a common effort. Hitherto, the state highway department, the counties and the municipalities had competed with each other bitterly in each legislative session for the lion's share of road revenues. This bickering over road funds was detrimental to highway progress. Yet, be-

Engineering Study and Vigorous Campaigning in Public Interest

of the remaining funds on trunk-lines within the limits of the incorporated places. The principle of city participation in state trunk-line construction is continued. Elimination of the geographic distribution requirement now enables the state highway department to apply funds on a planned statewide basis.

* *

In Michigan, beginning in the early 30's, property tax levies for highway purposes dropped rapidly to relatively small amounts. The new legislation recognizes the need for revenue beyond motor levies. The basic bill limits county local road expenditures to 25% of each county's share of state funds, and local street expenditures to 30% of each city's share. In effect the law limits state funds to about 50% of needed local road and street outlays. The Act states it is the intent of the legislature that those monies represent the total responsibility of the state for the local roads and streets, and that additional funds required must be

obtained from other sources as permitted by state law.

* *

To encourage up-grading of county highway work, \$5,000 of state funds are to be granted each county in which the county road commission employs a full time registered professional engineer for the major portion of the year. Counties, however, are allowed a 5-year period of grace.

* *

One of the most important provisions of the new legislation is the requirement for advance planning by all highway agencies. The counties and cities and villages must submit to the state highway commissioner biennial highway and street programs and past accomplishments based on long range planning, including standards and specifications for all projects.

* *

Also, the local units must submit annual records of the use of all state motor revenue funds received. Separate records must be kept of local expenditures for the

cost of administration, engineering and record keeping.

* *

Uniformity of local accounting is assured by the stipulation that the state highway department shall prescribe forms.

* *

Biennially, the commissioner must report to the governor and the legislature summarizing the program for improvements by the state highway department, counties, cities and villages for the next biennium.

* *

The official report also must describe progress made by the state highway department, the counties and the cities and villages, and account for all expenditures of state funds. This is in addition to the annual report on the receipt and allocation of state revenues.

* *

All agencies which do not comply with the provisions of the basic Act will forfeit state funds during the period of noncompliance.

cause of failure for the good roads program to be adopted in two successive legislative sessions, it appeared that the "spenders" would be forced to revert to their unhealthy practice of fighting each other at the Capitol.

However, this development did not materialize. The Board of Directors of the Federation decided to hitch up their belts and make another try in the spring of 1950 legislative session. As was pointed out, the Governor could then dictate what subjects the Legislature could consider in a special session. Governor Williams, who had succeeded Kim Sigler the year before, had set himself up as a good roads champion, and in this special session he emphasized the tremendous need for a highway improvement program. However, the Governor wanted to finance those needs with an income tax on corporations. This proposal was contrary to the financial recommendations of the Federation, but, more than that, was hostile to the majority of the members of the Legislature. While they wanted a good roads program financed by highway users, they would not support a good roads program

financed by a corporation profits tax. The Governor would not allow the Legislature to consider a gasoline or weight tax and the Legislature would not consider a corporation profits tax. So, once again, the Federation program was stymied.

Focused Public Attention

However, the publicity attendant to the quarrel between the Governor and the Legislature focused the public's attention on the need for good roads. By this time road and street agencies, feeling the pinch for additional funds, even more than they did when the program was introduced, and having better knowledge of the program rose up in much greater support of it than ever before.

Plans were laid for an all out fight for the good roads program in the 1951 regular session. Contacts with members of the Legislature running for election and statements by the various candidates for public office indicated overwhelming support for the program.

In January of 1951 the Legislature met and the Federation's bills were introduced in both houses by enough members of each house to insure their passage. However, "poli-

tics" was again to raise its ugly head and the Federation's legislation became the popular currency for legislative trading. As a result, it was mid-May before the Federation's bills were enacted into law and sent to the Governor for his signature. He had stated clearly that he would refuse to sign an increase in the gas tax of 1½¢, but would accept a 1¢ increase, provided it were accompanied by legislation he wanted passed. The majority of the members of the Legislature were not disposed to make such a deal and so the Governor vetoed the gasoline tax.

Detroit Votes Pledged

At this point a little history is in order. During the 1950 special session, the City of Detroit, anxious to complete its expressways in four instead of 14 years, asked the Legislature for permission to issue \$100,000,000 worth of bonds so that funds would be available immediately. Several members from Detroit were extremely anxious to have this legislation enacted.

The Chairman and some members of the key committees in connection with the bond issue for expressways

Mr. Legislator:

In pretty nearly every state the road systems are losing the battle with traffic wear and obsolescence, as you are well aware. And legislative action this year to raise new road funds has frequently been stymied by a confusion of aims and ideas. Mainly the trouble has been the lack of an engineering analysis of all the highway transportation needs of the state—and of clear and logical recommendations for legislative action based on this analysis, so obviously in the public interest that enactment becomes possible.

How much longer can your state wait for a solution to its problem of a retrograding highway system?

The national emergency and the demand for another all-out period of farm and factory production

give a new urgency to the need for stepping up highway modernization and giving your state's engineers the best administrative tools for the job. Scarcities or priorities notwithstanding, a way must be found to keep essential road and street construction and maintenance to the highest possible level, consistent with defense requirements.

Is your state one of the increasing number which have undertaken a statewide engineering investigation of the whole road problem?

A letter from you giving your viewpoint will be appreciated. We have benefited from the counsel and information thus received from lawmakers, and such replies will be held in confidence if you so desire.

Editor, Roads and Streets

were from rural Michigan. They were fearful that if expressways were taken care of by a bond issue there would be no effort to solve the state's road program with a gasoline tax. However, several Detroit members unequivocally pledged their support of the good roads program at the 1951 general session in return for enactment of the bond issue legislation.

In May of 1951 the promissory vote became due. It was now time for the Detroiters to make good on the good roads program.

The Senate overrode the Governor's veto within 20 minutes after receipt of his message. The vetoed bills were then rushed to the House of Representatives. It caught some of the members of the House off balance, particularly the Detroiters who are of the Governor's political faith, and so they voted to sustain him. The override vote was one short of the necessary 2/3 majority. However, on the following day it was moved to reconsider the vote by which the Governor's veto was sustained. This motion was then tabled and the Legislature adjourned for the week end.

Veto Overridden

During that period the members of the House from Detroit who had promised to vote for the good roads program were contacted by their supporters and by county and city offi-

cials who reminded them of their commitment made in the preceding legislative session. These men were by conviction backers of the good roads program, but had been subjected to terrific pressure to sustain the Governor.

On May 23, 1951, four of these Detroit members fulfilled their obligation to the people they represent and voted along with 66 other members to override the Governor, thus giving Michigan perhaps the nation's most advanced highway legislation—the good roads program.

Prominent labor groups vigorously opposed the program, threatening to bring suit in the Supreme Court on the basis that the vote to reconsider the override was illegal. The best legislative and legal counsel in Lansing indicates that the move was entirely correct and that the Supreme Court would so rule. At this writing no action has been taken to set aside the wishes of 70 members out of 100 of the House of Representatives and 25 out of 32 in the Senate.

To the everlasting credit of the cities, counties, state highway department and other groups backing the good roads program is the fact that for three and a half years they withstood the continued efforts of many groups and individuals attempting to disrupt the Federation's united front. The success of the program

can be attributed to the fact that the organizations and interests having a stake in road development were constant in their cooperation with and faith in each other—a powerful lesson in highway progress.

The program went into effect on June 1, 1951. The gasoline tax was increased 1½¢ and the weight tax on commercial vehicles over four tons was raised on a graduated scale from 20% to 80%. These measures will bring in about \$30,000,000 additional revenues. The entire good roads program, as outlined in the preceding paragraphs, was adopted.

As one newspaper man remarked when the Governor's veto was overridden—"The road problem is now out of the hands of the politicians and up to the road and street administrators. We shall see what they can do."

Scrap Drives Are Starting Again

Several highway departments recently have instructed their district office personnel to conduct a search and cleanup program for critical materials and materials which can be sold as scrap.

Steel shapes and other items vitally necessary to help keep equipment rolling should, of course, be held in stock. But the departments still are in a position to render a valuable public service here. Nearly every organization has stuck away somewhere unserviceable or condemned tires and tubes, mixed scrap iron, heavy scrap iron parts, oil and tar drums unfit for further use, aluminum or copper, tin or brass scrap, junk storage batteries, etc.

It won't hurt anyone to be on the alert for ways to co-operate by gathering up and disposing of such scrap materials.

250,000 Cross Camden Bridge in Week-End

Indicative of growing traffic volumes everywhere, a new travel record was set for the Delaware River bridge between Philadelphia and Camden on the week-end of June 15-17. The Sunday count was 95,515 vehicles, and the 3-day week-end count 250,982. Best previous records were respectively 93,010 and 244,718, made in 1950.

IT COSTS LESS TO BUILD GOOD ROADS THAN TO HAVE POOR ROADS

Citizens of Many Nations Forming Good Roads Associations

Well planned highways generate social and economic benefits that are immediate for the people and the nation they serve. The development in motor vehicle transportation, which follows the building of good roads, under favorable conditions ushers in higher living standards through more efficient intercommunication, more rapid industrialization, and wider marketing of food products and manufactured goods.

Inspired by these benefits which have been so dramatically demonstrated in recent years, the International Road Federation since its founding in 1948 has cooperated with citizen groups and business leaders in many countries of the world. The purpose has been to give counsel in the forming of "good roads" associations, the common goal being to encourage the development of adequate national highway systems.

The success of the Federation has been outstanding, and to date the Federation's activities have been projected into more than 50 countries where free enterprise exists. Nineteen of these countries have national good roads associations affiliated with the Federation. Similar organizations, meantime, are in various stages of formation and the Federation has expectations of ending 1951 with national affiliates in at least 30 countries.

During 1950, the Federation acquired five new national affiliates, four in the Western Hemisphere and one in the European-East area. National "good roads" associations were nonexistent in Latin America and there was only one such association in the whole Western Hemisphere outside the United States three years ago. The existing association at that time—in Canada—was not too active but since has become a very strong organization. There are now nine associations in Latin America and three more are in formation.

The Egyptian Road Association was organized in 1950 as an affiliate of the Federation in the European-East Region. Also under this region are the British Road Federation, Union Routière de France, Centraal Overleg, Svenska Vägforeningen, Federation Routière Suisse, Indian Roads and Transport Development Association, Federation Routière Belge and the East African Road Federation. In formation are associations in Ceylon, Pakistan, South Africa, Australia, New Zealand, Thailand and Iraq.

Each of these road associations is

dedicated to promoting the education of both the public and the government in the social and economic benefits generated from adequate road systems. Each is a clearing house for information related to highways and highway transport. Each provides a non-government approach to technical assistance in the planning, financing and development of highways.

The Federation which has offices in Washington and London, will soon open a third office in Paris. The Paris office, in addition to being the headquarters for continental Europe, Turkey and Greece, will participate in all international meetings on highways and highway transport at Geneva.



★ Roy W. Crum

sonal and professional abilities came to the fore, stamping him as one of the pioneers in research in highway materials and related problems.

During the years that followed highway research activities developed on such scale that a national agency to coordinate and foster orderly research was seen to be needed. The Highway Research Board was created and Mr. Crum was made its director in 1928. In the years since then the Board's activities have broadened, until today they encompass several departments and some 70 committees reaching into every phase of highway engineering.

Roy Crum of Research Board Passes

Roy W. Crum, for nearly a quarter of a century director of the Highway Research Board in Washington, died May 13. He was 66. Since 1928 he had guided the Board, during a period when its work assumed constantly growing importance and resultfulness.

Graduating from Iowa State College in civil engineering in 1907, Mr. Crum was a teacher at this school until 1919, when he left to take charge of the newly created materials testing department of the Iowa Highway Department. In this position his per-

IRF and "Point 4" Plan Joint Program

The International Road Federation, with offices in Washington, D.C., London, Paris and affiliated good roads associations in more than 30 countries, will participate with the U.S. Government's "Point 4" in a unique technical assistance program. As announced by Harry G. Bennett, Technical Cooperation Administration, Washington, D.C., the effort will aid good roads campaigns eventually covering Latin America, the Near East and Southern Asia.

This agreement signals the first step taken by a broad base of private industry in the U.S. and in other countries to participate in the technical assistance program of the United States government. The International Road Federation, known familiarly as IRF, is sponsored by more than 350 private companies. Its affiliated good roads associations are sponsored locally in each country. Through the IRF and its affiliates, many of the com-

panies in the U.S. and elsewhere will provide technicians, machinery, equipment, materials and working space for certain educational projects outlined in Point 4 agreement. On the basis of a survey to be made by IRF, it is planned to develop a long-range highway aid program under Point 4 and to extend industry's participation in subsequent IRF-Point 4 agreements. A grant of \$85,000 was made by TCA to finance the initial phase of three activities, as follows.

1. Two pilot schools for training operators and mechanics in the use of farm and highway equipment.
2. Inauguration of Point 4 fellowships for engineers in countries outside the U.S. to study advanced techniques in U.S. universities.
3. A survey for the purpose of determining the kind and extent of technical assistance required for a long-range technical assistance program by various nations.

JOB and EQUIPMENT IDEAS

Sheepsfoot Tamper for Narrow Ditch Backfill

An interesting device built by a contractor for tamping backfills in a narrow trench is pictured here. The Conduit Contracting Company of Fulton, Missouri, used this machine in a roadside ditch in connection with installation of utility piping.

The machine is a Ware loader frame mounted on an Oliver crawler tractor. In place of the loader bucket there has been installed a special 8-in. wide cylinder studded with 2-in. diameter cylindrical tubes welded on to form tamping feet.

Of course, there are trench rollers and trench rollers but we seldom see one that is only 8-in. wide designed to work in trenches less than a foot in width.

Trailers Built for New Mexico Maintenance Men

The New Mexico State Highway Department this past winter designed and built two sets of trailers consisting of three units each, for use by the department's surface treating crews when away from towns of any size.



★ The sheepsfoot drum on this homemade outfit is only 8-in. wide

L. D. Wilson, department administration engineer, units as completed have been very satisfactory except for one item. The gasoline powered electric generating plant was installed inside one of the units and although provision was made to refuel from the outside, the operation of the plant proved unpleasant to occupants of the trailer. It is planned to put the light plant on a separate trailer if any future units are built.

Ripper Teeth Effective on Dozer

New type ripper attachments for bulldozers were said to have saved 62% on roadbed leveling costs on a recent job in Shasta National Park in Northern California. Five Hensley rippers attached to the blade of a 13-ft. LeTourneau angledozer uprooted about 75 ft. of brush in each run at a cost of \$60 per mile, according to one report. This was compared



★ Scene during fabrication of big trailers, designed for New Mexico Highway Department's asphalt road crews to use when away from large towns





★ (Left): ripper equipped dozer working in Shasta National Park. (Right): the city of San Jose used this unit

to the former \$160 per mile hand grubbing cost. The equipment removed a heavy growth of brush, numerous three and 4-ft. boulders in widening an access road.

Another instance where ripper teeth on a dozer blade served effectively was reported by the public works department of San Jose, California. The operator, using an Allis-Chalmers HD-7 tractor equipped with a Baker straight blade dozer so fitted out, ripped out a borrow pit in cemented rock.

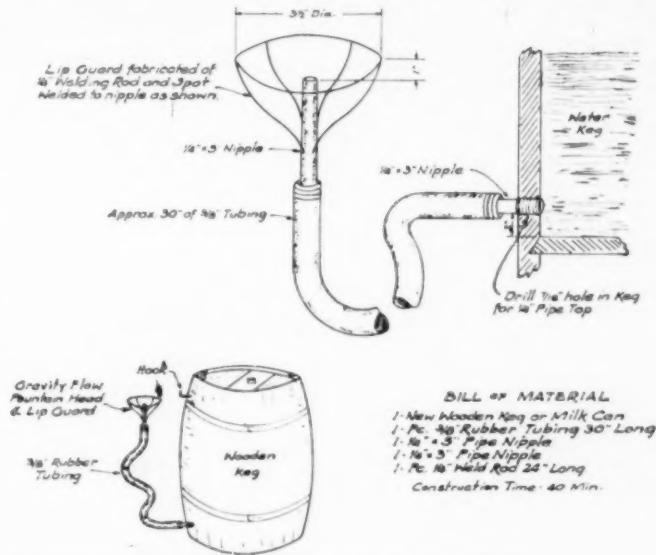
Rippers of this type (pictured) are designed to dig to a depth of 12 in. if there is not an excessive amount of rock in the surface. When a large amount of rock or shale is encountered, adequate ripping action can usually be obtained in two 6-in. passes.

Old I-Beams Adapted for Bridge Work

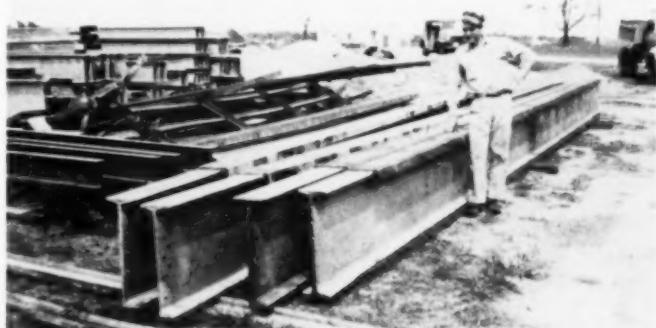
The Texas Highway Department has made extensive use of salvage I-beams in the strengthening or reconstruction of floor systems in highway bridges. Also in constructing complete new spans in some instances.

This photo shows how beams have been spliced to secure the desired length, and boxed or tied together in pairs, as part of a bridge floor rebuilding schemes. Plates have been welded over the top and bottom flanges, the plates extending over the flange edges, and covering most of the beam length.

Effort of this kind is considered to have a double value today. It helps utilize all manner of available salvage shapes, at a time when steel is hard to "come by." And advantage is taken of the fact that many bridges can be made to carry considerably higher live loads with safety strengthening the floor system alone, the floor usually being the weakest part of old bridges.



★ A proposed method of dispensing drinking water, as designed for the Pennsylvania Turnpike Commission, utilizing an approved and economical gravity flow fountain supplied from a barrel



★ Salvage I-beams spliced to required length and tied together in pairs with plates top and bottom—part of scheme to adapt the steel to new bridge use

The Angle Prism

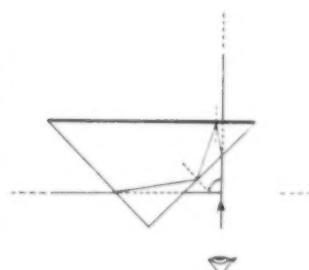
and its Application to Highway Surveying Work

This little hand instrument can reduce field and office labor and often take the place of transit and tape.

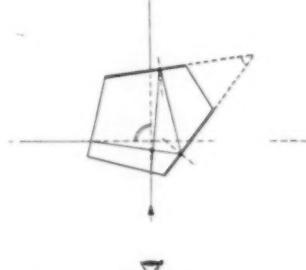
By H. S. Wahlen

ONE of the most useful instruments for reducing field and office work in preliminary highway as well as location surveys is the right angle prism. This convenient and accurate hand surveying instrument has multiple uses in highway and road surveys. Quite often it is possible to eliminate costlier transit and tape measurements, but it is hardly ever found in the instrument equipment of a survey party.

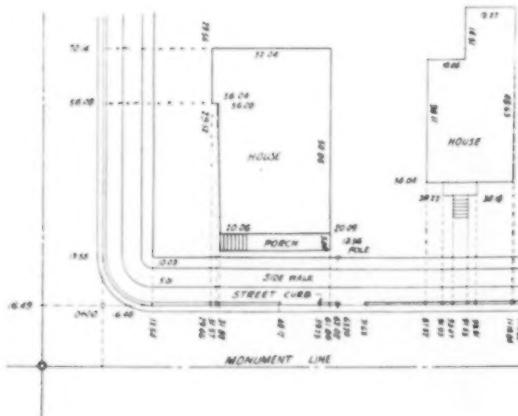
The reflecting right angle prisms are triangular or pentagonal prisms,



★ Fig. 1. Triangular prism



★ Fig. 2. Pentagonal prism

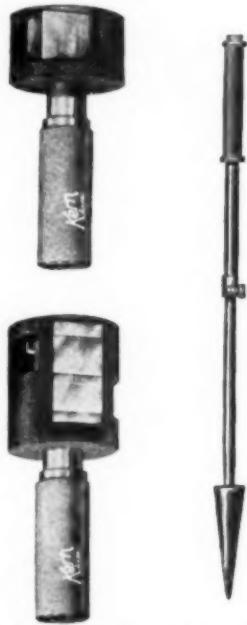


★ Fig. 7. Detail survey

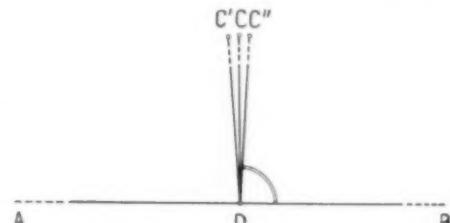
precisely ground so as to produce a 90-degree deviation of a light ray.

The triangular right angle prism is manufactured with two equal sides enclosing a 90-degree angle. The third side is silvered. A ray entering the prism is twice reflected as shown in Fig. 1. The prism can be used with an ordinary plumb bob or with a special telescoping plumbing rod (Fig. 5) to which a plumb bob is fixed.

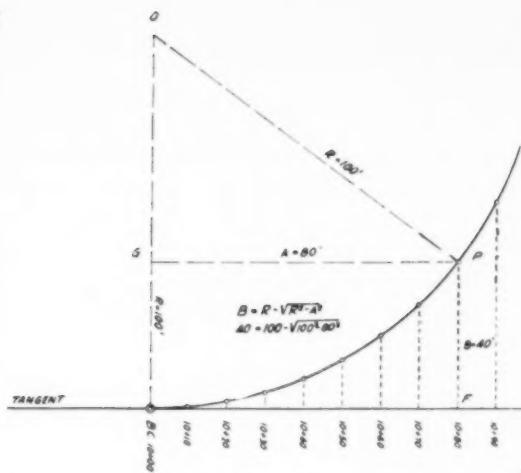
The pentagonal prism is far superior to the triangular prism. The re-



★ Fig. 3-4-5. Pentagonal right angle prism, double pentagonal right angle prism, and telescoping plumbing rod.



★ Fig. 6



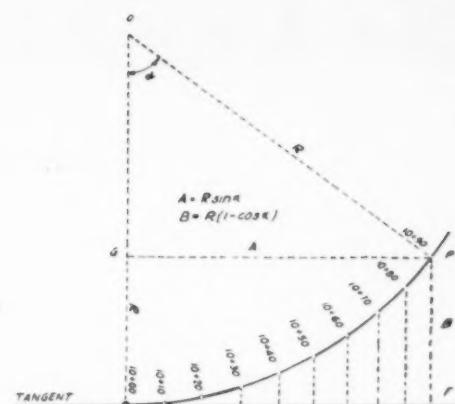
★ Fig. 8. Curve by offsets from tangent

right-angle prisms set one above the other.

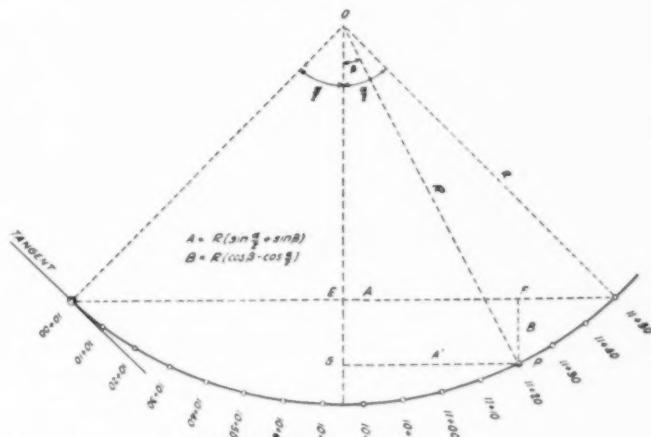
A field check to determine the working accuracy of a right-angle prism can easily be made by setting the prism over a point D in the line AB (Fig. 6). The right angle ADC at D should produce point C, but point C' is obtained instead. On the other hand the offset point C'' is found by establishing the right angle BDC'' at D and the angle C'DC'' is double the working error of the right-angle prism. However this error is due more to an accidental than an instrumental error of the prism. Since this accidental error is considerably larger than the instrumental error it is advisable to check the complementary right angle.

If it is desired to offset a point C within 0.01 ft. and the working accuracy of the right angle prism is one minute then the offset distance should not exceed 0.01/0.00029 or 34 ft.

The right angle prism has many applications in surveying work as will



★ Figure 9



★ Fig. 10. Curve by offsets from chord

be shown in the following few examples. Fig. 7 shows a detail survey

made with a right angle prism. The center line of the street being the monument line is offset and in order to keep the survey party away from the street traffic and protect the survey markings from destruction the gutter line is used as reference line. Right angle offsets are taken to all points of interest for the detail survey. Two measuring tapes are generally used, in this case, one to measure the stationing and the other to measure the offsets. All notes should be shown by sketches in a fairly large scale in a similar manner as shown in Fig. 7 which will facilitate the office work.

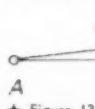
Building dimensions should be measured for a check. If irregular (Continued on page 92)



★ Figure 11



★ Figure 12



★ Figure 13

How Army and Navy

Defense Construction Contracts are Handled

CONTRACTORS interested in doing work for the armed forces will find use for this summary covering contract, allotment and control procedures.

As described by R. G. Lovett, Col., Corps of Engineers, and B. S. Shute, Col., Corps of Engineers, in *The Military Engineer*, March-April, 1951, the army engineer procurement is as follows:

Engineers Military Projects

Under ordinary circumstances it is the policy of the Corps of Engineers to let all military construction by lump-sum contract after competitive bidding except when reasons of National Security or other compelling considerations necessitate the use of negotiated contracts. Because of the present national emergency and the expanded construction program, it is expected that negotiated lump-sum or cost-plus-a-fixed-fee contracts will be used to a greater extent.

The construction program is executed through a decentralized organization of division engineers and their subordinate district engineers. The divisions and districts now performing military construction and the territory they comprise, are indicated on Map 2. The addresses of the Divisions and other Districts are listed under Civil Works below.

The District engineers are the contracting officers on construction contracts, and it is in their offices that bids are opened when construction is advertised. Under most circumstances, the award to the successful bidder can be made by the division or district engineer without recourse to higher headquarters. At present the field offices of the Corps of Engineers have authority to award negotiated contracts up to \$5,000,000. Construction projects for which the Corps of Engineers has design responsibility are assigned to the appropriate district engineer for accomplishment. Selections and recommendations for the use of architect-engineers on specific projects are made by these officers. All architect-engineer contracts are negotiated.

Engineer firms or architect-engineer firms are employed whenever the design of an authorized military con-

struction project can not be accomplished in a timely manner with available Government forces or when the project requires technical facilities and specialized skills not available in the district. Emphasis is placed on selecting firms or individuals experienced in the design of the particular type of project involved, and with the ability to organize sufficient personnel to expedite the work. Construction anticipated in the immediate future will require the use of architect-engineer services, because of the considerable volume of design work to be accomplished.

Information on Contractors. Construction contractors or architect-engineers who are interested in performing major construction or rehabilitation and minor construction work for the Corps of Engineers should provide information on their organization, background, and experience to each district engineer having jurisdiction over areas in which they would like to work. The same information should be furnished the Chief of Engineers, Washington 25, D.C., attention of the Assistant Chief of Engineers for Military Construction. If there is a material change in these data, the submission of amended information would be advisable. The following are suggested as the types of information which will be of assistance to all concerned in evaluating the qualifications of contractors:

Architect-Engineers:

Fill out and submit *Engineer Form 1774*—Architect-Engineer Questionnaire.

Construction Contractors:

Fill out and submit *Engineer Form 459* (Data on Contractors), and prepare and submit brochure, if available, including a brief background of the organization and key personnel (indicate security clearance, if any, already on record), financial data (balance sheet, credit capacity), list of major projects performed in past 10 years (owner, type, cost), list of major items of construction plant, and such other information as is deemed pertinent.

It is not required that contractors incur the expense of preparing brochures as a condition to their receiving consideration. However, if such data are available, they may prove to be of mutual benefit. Information on joint-venturers may be consolidated on *Form 459*. However, if brochures are submitted, it is desirable that they be

furnished under one cover with the record of each participating company shown separately. Contractors desiring to be placed on bidders lists should so indicate to any of the district offices in which they are interested. The submission of *Form 459* or a brochure will not in itself accomplish this since the data are primarily for reference in selection of contractors for negotiations.

Engineer Civil Works

In addition to construction and supply for military purposes, the Corps of Engineers is charged by law with the planning, construction, operation, and maintenance of public works for flood control, hydroelectric power, improvement of navigation, and other related water uses—commonly referred to as the “Civil Functions of the Corps of Engineers.”

The Civil Functions are carried out under the direction of the Chief of Engineers by forty-two Engineer Districts located throughout the United States and in Alaska, under the immediate supervision of eleven Division Offices located strategically throughout the country. The district office is the basic unit charged with the field planning and execution of public improvements.

District engineers are designated as contracting officers, with authority to accomplish procurement and to execute formal and informal contracts necessary in the prosecution of Civil Works activities under the jurisdiction of the respective districts. Within prescribed monetary limitations, division and district engineers are delegated authority to issue specifications and to award contracts. The construction of civil works is normally performed by contract, awarded as the result of competitive bidding.

The addresses of division engineer offices and district engineers:

GREAT LAKES DIVISION,* 1660 East Hyde Park Boulevard, Chicago 15, Illinois—*Buffalo District*, Engineer Park, Buffalo 7, New York; *Chicago District*,* 520 Merchandise Mart, Chicago 54, Illinois; *Detroit District*,* 2015 Cadillac Tower, Detroit 31, Michigan; *Duluth District*, Engineer Building, Canal Park, Duluth, Minnesota; *Milwaukee District*,* 428 Federal Building, Milwaukee 1, Wisconsin.

LOWER MISSISSIPPI VALLEY DIVISION,

Now-Free TRUCK SAVER Inspection

*First step of a complete
TRUCK SAVER plan*



- Available to all International Truck owners
- No cost, no obligation for a 99-point checkup
- For a limited 3-month period ending September 30



How easily you can keep your Internationals operating at peak efficiency in an uncertain future may depend on what you do within the next 90 days.

If you take advantage of our Truck Saver Inspection, you'll be taking the first step toward putting your Internationals in shape for the "come what may" days ahead.

Since this inspection doesn't cost you a penny, you have everything to gain—nothing to lose. You can save dollars now and perhaps many more before the end of 1951.

So get ready now to keep your trucks on the job despite shortages. The sooner you get your free Truck Saver Inspection, the sooner you see practical reasons why you should take advantage of our complete International Truck Saver Plan.

Look what the complete International Truck Saver Plan offers

The complete International Truck Saver Plan has been developed by experts, after a thorough study of today's truck operating problems. It offers these benefits to International Truck operators:

1. **Better performance** over a longer truck life: trucks are kept in shape to do the most efficient job possible until they can be replaced by new units.
2. **Delays minimized** in getting new parts: by anticipating future requirements, the demand for needed parts can be accurately estimated.
3. **Maintenance costs cut**, down time reduced: by preventing major breakdowns, a big saving is effected in both time and money.
4. **Truck value maintained**: trucks kept in the best possible condition are worth more when it's time for replacement.

Take advantage of the International Truck Saver Plan now

If you want to save yourself trouble and money in the months ahead, you belong in the International Truck Saver Plan.

Get your free Truck Saver Inspection—find out from your International Truck Dealer or Branch how the plan can help you keep your Internationals going at peak efficiency.

International Harvester Builds
McCormick Farm Equipment and Farmall
Tractors . . . Motor Trucks
Industrial Power . . . Refrigerators and Freezers



International Harvester Company • Chicago

INTERNATIONAL TRUCKS

Heavy-duty engineered for the long haul



BUILDS BETTER FORMS

to last longer



to save time



for real economy



DUAL DUTY FORMS

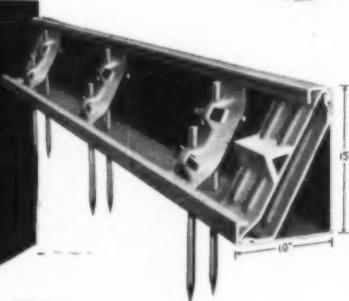
For Airports & Highways

EACH FORM CAN BE
USED FOR TWO
SLAB THICKNESSES

Sizes from
8" x 9" to 20" x 24"
in 10-foot lengths



THIS SIDE FOR
15-INCH SLAB



THIS SIDE OF SAME FORM
FOR 10-INCH SLAB

"DUAL DUTY" FORMS FOR THE BIG JOBS

- No need for two sets of forms when the Helco dual duty form will do the job. Dual duty forms have double treads permitting the use of spreader and finishing machines in either position. $\frac{1}{4}$ " steel plate, welded construction. Special sizes to specifications.

STANDARD FORMS FOR GENERAL USE

- Heavy rolled steel, all welded construction. Wide tread with five rigid supports per each 10-foot section. 50% more strength with Heltzel upturned base flange. Exclusive Heltzel sure-grip stake pockets. 1" diameter stakes of re-rolled rail material with hot forged points.

WRITE FOR HELTZEL BULLETIN K-19

HELTZEL

STEEL FORM & IRON CO.
WARREN, OHIO

Mississippi River Commission Building, Vicksburg, Mississippi—*Memphis District*, mail address P. O. Box 97, Memphis 1, Tennessee, office in West Memphis, Arkansas; *New Orleans District*, Foot of Prytania St., New Orleans 9, Louisiana; *Vicksburg District*, U. S. Post Office and Courthouse Building, Vicksburg, Mississippi.

MISSOURI RIVER DIVISION,* 206 South 19th St., Omaha 1, Nebraska—*Fort Peck District*, Administration Building, Fort Peck, Montana; *Garrison District*, Bismarck, North Dakota; *Kansas City District*,* 10 East 17th St., Kansas City 8, Missouri; *Omaha District*,* 1709 Jackson St., Omaha 2, Nebraska.

NEW ENGLAND DIVISION,* mail address P. O. Box 2316, Boston 7, Massachusetts, office in Building No. 21, Boston Naval Shipyard, South Boston, Massachusetts.

NORTH ATLANTIC DIVISION,* 1216 Federal Office Building, 90 Church St., New York 7, New York—*Baltimore District*,* 24th and Maryland Avenue, Baltimore 3, Maryland; *New York District*,* 80 Lafayette St., New York 13, New York; *Norfolk District*,* Foot of Front St., Norfolk, Virginia; *Philadelphia District*,* 121 North Broad St., Philadelphia 1, Pennsylvania; *Washington District*,* 1st and Douglas Sts., Washington 25, D. C.

NORTH PACIFIC DIVISION,* 10th Avenue and Washington St., Portland 5, Oregon—*Alaska District*,* Anchorage, Alaska; *Portland District*, 828 Pittock Block, S. W., Portland 5, Oregon; *Seattle District*,* 4736 East Marginal Way, Seattle 4, Washington; *Walla Walla District*, 19 East Poplar St., Walla Walla, Washington

OHIO RIVER DIVISION, Post Office and Courthouse, Cincinnati 1, Ohio—*Huntington District*,* Madison Avenue and 8th St., West Huntington, West Virginia; *Louisville District*,* 830 West Broadway, Louisville 1, Kentucky; *Nashville District*, 303 U. S. Courthouse, 7th Avenue and Broadway, Nashville, Tennessee; *Pittsburgh District*, 325 New Federal Building, Pittsburgh 19, Pennsylvania.

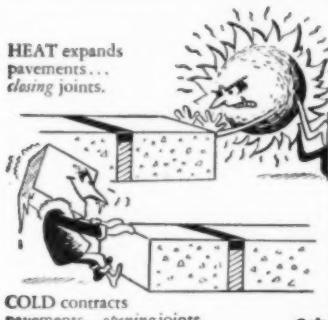
SOUTH ATLANTIC DIVISION,* 836 Old Post Office Building, Atlanta 1, Georgia—*Charleston District*,* 33 Customhouse, Charleston 1, South Carolina; *Jacksonville District*,* 575 Riverside Avenue, Jacksonville, Florida; *Mobile District*, 2301 Grant Street, Mobile 7, Alabama; *Savannah District*,* P. O. Box 889, Savannah, Georgia; *Wilmington District*,* 308 Customhouse, Wilmington, North Carolina.

SOUTH PACIFIC DIVISION,* Oakland Army Base, Oakland 14, California—*Los Angeles District*,* 741 South Figueroa Street, Los Angeles, California; *Manila District*, A.P.O. 928, c/o Postmaster, San Francisco, California; *Sacramento District*,* 1209 8th St., Sacramento 8, California; *San Francisco District*,* 180 New Montgomery St., San Francisco 19, California.

SOUTHWESTERN DIVISION,* 1114 Commerce St., Dallas 2, Texas—*Albuquerque District*,* P. O. Box 1538, Albuquerque, New Mexico; *Fort Worth District*,* 1127 Texas and Pacific Building, Fort Worth, Texas; *Galveston District*,* 606 Santa Fe Building, Galveston, Texas; *Little Rock District*,* 300 Broadway, Little Rock, Arkansas; *Tulsa District*,* 2000 North

Where weather extremes meet...

HEAT expands pavements... closing joints.



COLD contracts pavements... opening joints.



Flintseal*
is the
BIG NAME IN JOINT-SEALING!

Mile after mile of Flintseal highway joints prove that this *rubber asphalt thermoplastic* joint-sealing compound has well earned its great reputation! Engineers and contractors now know that concrete pavements, joint-sealed with Flintseal, last years longer than when ordinary materials are used.

Flintseal adheres tenaciously, does not lose bond at low temperature or flow in hot weather... remains extensible and compressible through complete cycles of expansion and contraction of the concrete.

Specify Flintseal Hot-poured Joint-sealing Compound

(Fed. Spec. SS-F-336a)

You will obtain more trouble-free mileage of concrete pavements by specifying Flintseal... the big name in joint sealing.

Write for Free, illustrated, descriptive Booklet

Complete technical data and specification procedures are available also upon request.

THE FLINTKOTE COMPANY
Industrial Products Division
30 Rockefeller Plaza
New York 20, N. Y.



FLINTKOTE
Products for Industry

*Reg. U. S. Pat. Off.

Memorial Drive, Tulsa 2, Oklahoma.

UPPER MISSISSIPPI DIVISION, 1114 Market Street, St. Louis 1, Missouri—Rock Island District, Clock Tower Building, Rock Island, Illinois; St. Louis District, 808 U. S. Courthouse and Customhouse, St. Louis 1, Missouri; St. Paul District, 180 East Kellogg Boulevard, St. Paul, Minnesota.

TULLAHOMA DISTRICT, * P. O. Box 2091, Tullahoma, Tennessee.

Conclusions

Persons and firms desiring to do business with the Corps of Engineers in connection with *** military construction or civil works, should get in touch with the appropriate field district or office as listed above, each of which maintains bidders' lists, issues invitations to bid, and executes and administers contracts. It is emphasized that, in dealing with the Corps of Engineers, it is not necessary to go to Washington.

Navy Engineer Procurement

Following is an abstract of an article, "Navy Engineer Procurement", by E. R. Hansen, Captain, Civil Engineer Corps, U.S. Navy, and Warren E. Young; *The Military Engineer*, March-April, 1951.

The Navy Bureau of Yards and Docks and its military component, the Civil Engineer Corps, is charged with the design, construction, and maintenance of naval shore establishments. This involves, at present, a large-scale program of construction and rehabilitation of naval installations; and the procurement of construction, weight handling, utility, and automotive equipment.

To carry out this increased program, the Bureau has decentralized authority to its nation-wide field organization which consists of sixteen public works offices (DPWO), one in each of the fourteen Naval Districts, and one in each of two Naval Commands. Each of these offices is a miniature of the Bureau organization. In addition, for certain large construction projects, an independent officer-in-charge of construction reports directly to the Bureau. The addresses of these offices and the areas included in their districts are shown in the following list.

DISTRICT PUBLIC WORKS OFFICES

(Areas served by each office are given in *italics*)

Maine; New Hampshire; Vermont; Massachusetts; and Rhode Island—District Public Works Office, First Naval District, 495 Summer Street, Boston 16, Massachusetts.

Connecticut; New York; northern part of New Jersey—District Public Works

*Also perform Engineer Military Construction functions.

**There is No
DETOUR
from SAFETY
when **DIETZ**
is on the Job**

DIETZ NIGHT WATCH LANTERN



Burns 100 hours

Releases Straight-line Pencil Beam of great intensity, visible from all angles, nearby and at really great distances. Exclusive fresnel globe and trip-lock release of chimney.

First in safety—for safety first.

DIETZ RED GLOBE LANTERN

The world's most reliable, portable light. Burn bright or dim for long hours, to the last drop of Kerosene, regardless of weather conditions. Economical. Available upon request with stamped-in "name" to prove your ownership.



DIETZ HIGHWAY TORCHES



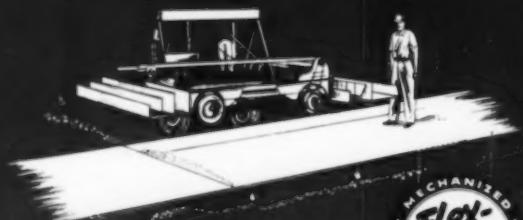
Made better, to serve better. Non-tip base. Leak proof, and weather proof. Burn for 30 hours. Popularly priced and very economical, too.

R. E. DIETZ COMPANY
EST. 1840
SYRACUSE 1, N. Y.
INPUT DISTRIBUTED THROUGH THE MARRING TRADE EXCLUSIVELY



A highly efficient concrete finishing machine that not only does a great job of finishing but can be converted into a compact "trailer" and rolled away from the job on its own built-in pneumatic tires in less time than it takes to tell about it — that makes real horse sense.

That's the FLEX-PLANE portable finisher that will quickly pay for itself with its amazing versatility — it will deliver the same high quality workmanship expected from any machine bearing the FLEX-PLANE name. Use your horse sense — get all the data on this useful finisher — it will more than pay you. Write . . .
The Flexible Road Joint Machine Company, Warren, Ohio.



MECHANIZED
CONSTRUCTION EQUIPMENT
Flex-Plane

Office, Third Naval District, 90 Church Street, New York 7, New York.

Pennsylvania; southern part of New Jersey; Delaware; and Ohio—District Public Works Office, Fourth Naval District, Building 1, Naval Base, Philadelphia 12, Penn.

Maryland; West Virginia; Virginia; and Kentucky less Severn River Naval Command and Potomac River Naval Command—District Public Works Office, Fifth Naval District, Naval Base, Norfolk 11, Virginia.

North Carolina; South Carolina; Georgia; Florida; Alabama; Tennessee; and Mississippi—District Public Works Office, Sixth Naval District, P. O. Box 365, Naval Base, Charleston, South Carolina.

Louisiana; Arkansas; Oklahoma; Texas; and New Mexico—District Public Works Office, Eighth Naval District, Building 16, U. S. Naval Base, New Orleans 12, Louisiana.

Michigan; Indiana; Illinois; Wisconsin; Minnesota; Iowa; Missouri; North Dakota; South Dakota; Nebraska; Kansas; Colorado; and Wyoming—District Public Works Office, Ninth Naval District, Administration Building, Great Lakes, Illinois.

Cuba; Dominican Republic; Puerto Rico; West Indies; Virgin Islands; Jamaica; and various other Caribbean Sea areas—District Public Works Office, Tenth Naval District, Naval Air Facility, San Juan, Puerto Rico, F.P.O. 116, New York, New York.

Arizona; Clark County, Nevada; southern part of California—District Public Works Office, Eleventh Naval District, 1220 Pacific Highway, San Diego 30, California.

Utah; Nevada (less Clark County); and northern part of California—District Public Works Office, Twelfth Naval District, Federal Office Building, San Francisco 2, California.

Washington; Oregon; Idaho; and Montana—District Public Works Office, Thirteenth Naval District 1611 West Wheeler Street, Seattle 99, Washington.

Hawaiian Islands; Midway Islands; Kure; Wake; Johnston; and Palmyra Islands; Kingman Reef and Kwajalein Atoll (Marshall Islands)—District Public Works Office, Fourteenth Naval District, Pearl Harbor, T. H., F.P.O. 128, San Francisco, California.

Panama Canal Zone—District Public Works Office, Fifteenth Naval District, Balboa, Canal Zone, F.P.O. 121, New York, New York.

Alaska and Aleutians—District Public Works Office, Seventeenth Naval District, Kodiak, Alaska, F.P.O. 127, Seattle, Washington.

District of Columbia the counties of Prince Georges; Montgomery; St. Marys; Calvert; and Charles in Maryland and the counties of Arlington; Fairfax; Stafford; King George; Prince William; Westmoreland, Virginia; and Alexandria, Virginia—District Public Works Office, Potomac River Naval Command, Naval Gun Factory, Washington 25, D. C.

Anne Arundel County, Maryland—Commandant, Attn.: Public Works Officer, Severn River Naval Command, Annapolis, Maryland.

TONCAN IRON

CORRUGATED METAL PIPE

Manufacturers of
Toncan Iron
Drainage Products

REALE PIPE & TANK CORPORATION
FORT ANDREW, IDAHO
BOISE, IDAHO
REIFER METAL COVERT CO., INC.
WESTMINSTER STATION,
VERMONT
THE BOARDWALK COMPANY
OKLAHOMA CITY, OKLA.
BLENCHARD PIPE & COVERT CO.
LOUISVILLE, KY.
CENTRAL COVERT CORPORATION
ALEXANDRIA, LA.
CHICAGO, INC.
MEMPHIS, TENN.
DOMINION METAL & COVERT CORP.
ROANOKE, VA.
EATON METAL PRODUCTS CORP.
HUTCHINSON, KAN.
EATON METAL PROD. CO. of MONTANA
BILLINGS, MONT.
EMPIRE STATE COVERT CORP.
GROTON, N. Y.
ILLINOIS COVERT & TANK CORP.
PEORIA, ILL.
JENSEN BRIDGE & SUPPLY COMPANY
SANDUSKY, MICH.
THE H. V. JOHNSTON COVERT CO.
MILWAUKEE, WIS.
AMHERST, N. Y.
H & M HIGHWAY MATERIALS CO.
COLUMBIA, MO.
REPUBLIC STEEL CORPORATION
CINCINNATI, OHIO
CANTON, OHIO
PHILADELPHIA, PA.
THOMPSON PIPE & STEEL COMPANY
DENVER, COLO.
TRI-STATE COVERT & WIRE CO.
TAMPA, FLA.
DECATUR, GA.
UTAH PIPE & STEEL COMPANY
OGDEN, UTAH
WISCONSIN COVERT COMPANY
MADISON, WIS.
WYATT METAL & BOILER WORKS
DALLAS, TEX.
HOUSTON, TEX.

**STANDS UP
UNDER
45-FOOT
FILL!**

Here two lengths of Toncan Iron Corrugated Metal Pipe
—72-inch diameter, 8-gage
—support 45 feet of fill.

Pile on the dirt! Toncan Iron Corrugated Metal Pipe has the strength to carry it . . . the flexibility to stand up under heavy loads, vibration, impact, severe weather changes and settling earth. It will not crack or crumble in hauling or in service.

Toncan Iron stands up in service, too. An *ALLOYED IRON* containing twice the copper in copper-bearing steels and irons—plus the proper amount of molybdenum to make the copper do its work—it has the highest rust-resistance of any ferrous material in its price class.

Toncan Iron Corrugated Metal Pipe is easy to handle, too—and easy to install—with unskilled labor.

See your nearest Toncan Iron Manufacturer—or write us

REPUBLIC STEEL CORPORATION • GENERAL OFFICES: CLEVELAND 1, OHIO

Toncan Copper Molybdenum Iron Drainage Products include:
Corrugated Metal Pipe • Perforated Corrugated Metal Pipe • Sectional Plate Pipe
Sectional Plate Arches • Corrugated Metal Arch-Pipe • Sectional Plate Arch-Pipe
Corwel Subdrainage Pipe • Bituminous Coated and Paved Pipe



ANOTHER BREAK IN THE DIKE!

Tough words to hear when you're battling a river on a rampage. But that's what happened during the recent disastrous floods on the Fraser River in British Columbia.

Perhaps you don't have to keep "rivers caged up," but that's an important job for Fraser River Pile Driving Co., Ltd. and their experience again proves the unusual mobility and handling ease of MICHIGAN cranes.

Says K. A. Matheson of the above company, "In the City of Mission on the Fraser River, the MICHIGAN cranes did a splendid job owing to their mobility and being able to get from one break in the dikes to another in very short order. In particular the TLDT-20 with remote control was a decided advantage, as it enabled us to do the same work with one less man when labor of this sort was badly needed on other flood-fighting work."

Regardless of your type of work, when you need an excavator-crane . . . investigate MICHIGAN . . . you'll agree it's your best buy!

MICHIGAN POWER SHOVEL COMPANY

480 Second Street, Benton Harbor, Michigan, U.S.A.

The DPWO is authorized to make awards on competitive bid contracts up to \$1,000,000.

Naval Shore Construction

Construction work is let under competitive bid contracts, under negotiated lump-sum or unit price contracts, and under cost-plus-fixed-fee (CPFF) contracts. It is the policy of the Bureau to make awards on a competitive bid basis, and to resort to negotiated awards only when the nature of the work and the exigencies of the service make such action in the best interest of the government.

Under the competitive bid contract, the award is made after advertisement and receipt of sealed proposals based upon plans and specifications, to the lowest bidder who meets the specifications. Such construction is advertised on bulletin boards in all DPWO offices, in all Federal buildings, in the Bureau, and in the plan room of the Associated General Contractors. It is also listed in Dodge Reports, the Department of Commerce Reports, and in various trade journals. Liaison between interested bidders and the nearest DPWOs will result in early information on prospective work.

Negotiated lump-sum contracts or unit-price construction contracts are awarded by the Bureau. After interviewing a group of contractors selected on the basis of their qualifications, the contractor deemed best qualified is chosen. If a satisfactory lump-sum or unit price can then be agreed upon, the contract is made.

The Army Engineers and the Bureau of Yards and Docks are following a uniform standard in determining fees on CPFF construction contracts.

Cost-plus-fixed-fee construction contracts also are let by the Bureau. They are awarded after negotiation.

To be considered for a negotiated contract, the qualifications, capabilities, experience, and record of the contractor should be well known to the DPWO as he selects or recommends the contractors to be considered. It is, therefore, desirable that qualified contractors keep the local DPWO fully informed as to their availability and suitability for consideration in such awards.

In the case of construction projects in which subcontractors are interested, full information as to the prospective prime contractors may be obtained from the DPWO of the area in which the work is to be performed.

It is the policy of the Bureau that Architect Engineer contracts will not be awarded on the basis of cost competition. Such contracts are negotiated. The contracts are usually ne-

gated and awarded by the DPWO, after obtaining Bureau approval of the fee. Large contracts are normally negotiated and awarded by the Bureau.

It is emphasized by the Bureau that full details with respect to construction contracts, competitive and negotiated, may be obtained from any DPWO, regardless of where the work is to be done. Interested contractors are urged to keep in touch with local DPWOs which serve the areas with which they are concerned.

It is not necessary to go to Washington to transact business with the Bureau unless invited to do so by the Bureau of Yards and Docks in the case of negotiated awards.

Reader Comment

Editor, ROADS AND STREETS:

This comment is prompted by your letter and accompanying editorial from April ROADS AND STREETS on toll and free roads. The editorial is a sound summary of the situation.

I am completely in favor of a realistic program of financing that will provide adequate free highways to serve all of the traffic on an equitable basis.

Parts of our state fall into the metropolitan category you mention and, in consequence, we have what may be termed successful toll facilities. While our three toll bridges fall into the regular pattern of toll-retired bond facilities, our parkway toll stations do not.

Briefly stated the parkway situation is this. Tolls were levied at two stations to provide for the extension of the parkway system after the initial 38 miles (Merritt Parkway) were opened to use. The Wilbur Cross Parkway was constructed between Milford and Meriden using the money derived from these stations. We have availed ourselves of the provisions of the law permitting additional stations where an alternate free road exists and are opening a third station. Receipts from it will be added to the construction fund. In this connection it should be remembered that our entire parkway system is closely paralleled by free roads. When the final construction costs are met the parkway tolls expire.

Despite the success of our parkway toll plan I would prefer to see all of our roads free of tolls and completely capable of meeting the demands upon them.

G. Albert Hill,
State Highway Commissioner

The MAJORITY of Your Heavy Hauling Jobs can be handled PROFITABLY with... the POPULAR



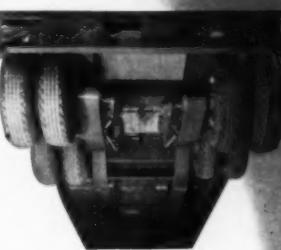
ROGERS Type "T"

LARGE CAPACITY IN AN 8 FT. DECK WIDTH—LEGAL IN ALL STATES. 8 TIRES ON 2 ROCKING STUB AXLES WITH LEVEL OR DROP DECK IN 15, 20, 25, 30 and 35 TON CAPACITIES

By reason of its versatile adaptability to all kinds of heavy hauling jobs, the Rogers Type "T" has steadily increased in popularity.

It's a "natural" for small and large contractors and haulers. If you are considering the purchase of one or more trailers, by all means investigate the Type "T".

It packs powerful advantages in a multi-purpose single unit. Write for full details and catalog.

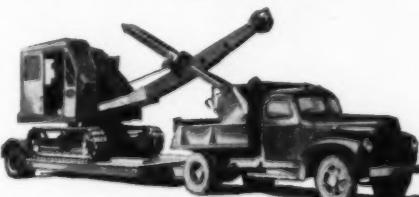


A worm's-eye view of the sturdy rear end and frame construction of the famous "T".

The rear end design of the Type "T" has proved so efficient it has been adopted as standard construction in Rogers Power-Lift Detachable Gooseneck Trailers.

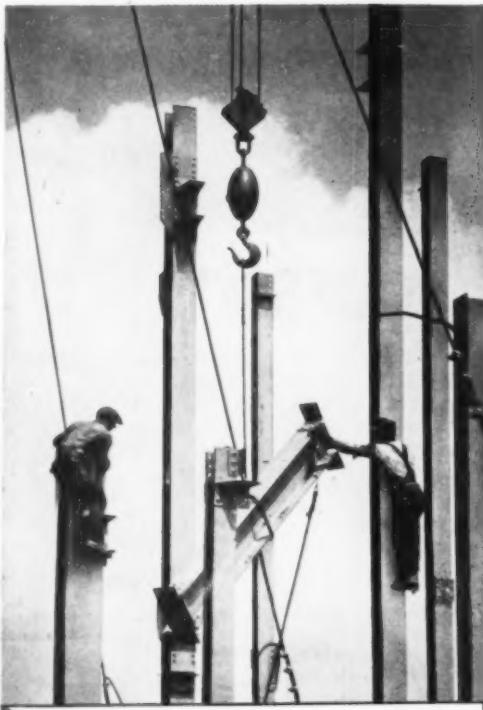
EXPERIENCE ROGERS PERFORMANCE
builds 'em Power-Lift sells 'em
ROGERS BROS. CORP.
ALBION, PENNA.

110 Orchard Street



Also of timely interest in this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizeable savings for contractors.

WIRE ROPE



ROEBLING ALL-PURPOSE SLINGS

with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices... have the full strength of the rope. Send for the full story.



On every type of equipment you'll do best with Roebling

"BLUE CENTER" STEEL wire rope is an exclusive Roebling development. It has to pass the most stringent tests for strength, fatigue and abrasion resistance . . . gives rope the extra life that spells economies. Besides, Roebling Preforming assures you top performance on the job. "Blue Center" Preformed is easy to handle . . . has better spooling qualities . . . reduces vibration and whipping.

Roebling makes a complete line of wire rope . . . offers the right grade and construction for every installation. Have your Roebling Field Man help choose the right rope for your equipment. Get his advice on the correct use and maintenance of wire rope. It is based on performance records on thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave. * Boston, 51 Sleeper St. * Chicago, 5525 W. Roosevelt Rd. * Cincinnati, 3253 Fredonia Ave. * Cleveland, 701 St. Clair Ave., N.E. * Denver, 4801 Jackson St. * Detroit, 915 Fisher Building * Houston, 6216 Navigation Blvd. * Los Angeles, 216 S. Alameda St. * New York, 19 Rector St. * Odessa, Texas, 1920 E. 2nd St. * Philadelphia, 230 Vine St. * San Francisco, 1740 17th St. * Seattle, 900 1st Ave. S. * Tulsa, 321 N. Cheyenne St. * Export Sales Office, Trenton, N. J.



Bituminous ROADS AND STREETS



• Paving on the New Jersey Turnpike, where a million tons of asphaltic concrete is being placed this summer. Photo shows placement of crushed stone for the first penetration macadam base course. (Detailed report in a later issue of Roads and Streets.)

Published by Gillette Publishing Company
22 West Maple Street, Chicago 10, Illinois

Ohio Contractors Handle \$3,000,000 Spring Repair Program
Another New Mexico Hot-Mix Resurface Project
Control of Hot-Mix Asphaltic Concrete, Simply Described
Early Patching Methods Following "Worst" N.Y. Winter

JULY, 1951

WHY YOU GET **IMPROVED HEATING,** **BETTER ROADABILITY,** **EQUALIZED LOAD DISTRIBUTION**



Etnyre Tank is a
long, low oval

ETNYRE TANK

Circulating System
BELOW Tank

Short, High TANK

Circulation
System

↑
Circulating System
on level with and
at one end of Tank

Get the Facts! Here is an exclusive

Etnyre feature of interest to every owner and operator of a bituminous distributor. It's the secret of Etnyre's success in building the finest spraying mechanism known today.

On a Tank of any capacity, on any given cab to axle, Etnyre uses a longer Tank with a lower center of gravity. This is possible because the Etnyre Circulating System is located **BELOW** the Tank. The results are:

Improved heating...more flue area per gallon of material—longer Tank allows for smaller oval, longer flues—less distance for heated material to travel from

flues throughout load. Stack temperature reduced because of faster dissipation of heat through material.

You get *better* roadability—the lower center of gravity makes possible faster, safer traveling speeds to and from the job—also improved appearance.

You get *equalized* load distribution—which saves on chassis and tires, makes for easier handling, adds years to the life of your truck.

This is just *one* of dozens of exclusive Etnyre advantages. For the complete story, phone your nearby Etnyre Dealer or get in touch with us today!

E. D. ETNYRE & CO., Oregon, Ill.

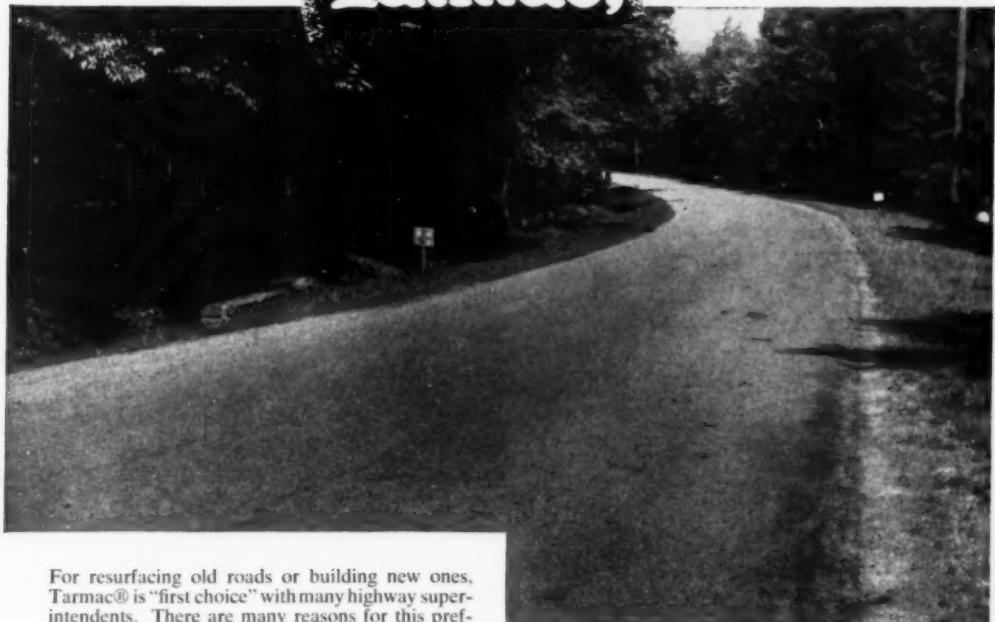
SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS



a durable road . . .
easy and economical to maintain

... IT'S **Tarmac, OF COURSE!**



For resurfacing old roads or building new ones, Tarmac® is "first choice" with many highway superintendents. There are many reasons for this preference. One of them is the fact that Tarmac speeds up construction work, and makes it easier to complete jobs on schedule. This faster job progress is made possible by these unusual properties of Tarmac:

PENETRATION. Tarmac penetrates quickly, thoroughly and uniformly into old or new, dry or moist roadbeds.

MIXING ABILITY. Tarmac mixes easily and speedily with all types of local aggregates.

ADHESION. Tarmac adheres quickly and firmly to the aggregate.

WETTING CAPACITY. Tarmac even "cuts through" dust or moisture films to coat the aggregate—and

does it quickly.

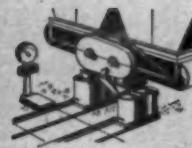
Besides speeding up construction work, Tarmac makes roads that, in the long run, cost less because they are tough, durable and long lasting. Further, these roads are easy and economical to maintain. Tarmac even resists the "stripping" action of water and the disintegrating action of oil and gasoline drippings.

Most important, Tarmac makes *quality roads* . . . roads that are smooth to ride on, *but hard to skid on*. Send for our free booklet, "Surfacing with Tarmac." It shows how you can construct and maintain all types of highway and airport surfacing.



Barber-

BITUMINOUS MIXING PLANTS



Mix sampling and calibration features provided on B-G High Capacity Plants for mixing highest type 3-and-4 aggregate mixes. Convenient, accurate calibration by weight.

ACCURATE MIX CALIBRATION...BY WEIGHT ON A CONTINUOUS FLOW BASIS CONVENIENT FOR OPERATOR AND INSPECTOR!

Barber-Greene Bituminous Mixing Plants provide many control features not offered in any other type of plant. Here are a few of the provisions that help accomplish these advantages:

AGGREGATE GATES, when set to feed the correct amount of aggregate from each bin, may be locked in position.

OVERFLOW SPOUTS are provided on each aggregate bin for balancing aggregate by rejecting any excess of any size in the bins.

AUTOMATIC CUT-OUT stops plant operation in case of deficiency of any aggregate size.

FINES FEEDER for introducing mineral filler in correct proportion to total mix.

GRADATION UNIT SCREEN and bin design permit separation of aggregate into 2, 3 or 4 fractions to meet any specifications.

DUST COLLECTOR for use with any plant when it is necessary to conserve desirable fines in aggregate.

BY-PASS GATE for convenient calibration, inspection and sampling. Aggregate in each bin may be individually sampled without interference to plant operation and production.

BY-PASS GATE ahead of pug mill. Composite aggregate sample may be obtained for convenient testing without interfering with operation and production.

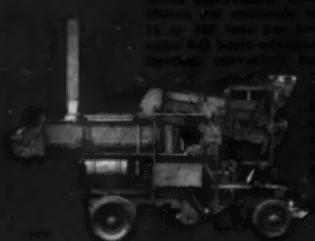
ACCURATE, POSITIVE-DISPLACEMENT bitumen metering pump with interlocked drive to aggregate feeders to guarantee unvarying proportion of bitumen to aggregate.

see your B-G distributor ...

Greene

TO MEET ALL MIX SPECIFICATIONS

FOR THE CAPACITY YOU NEED...
THE MIXES YOU WANT TO MAKE... **SELECT FROM**
4 BASIC B-G UNITS



B-G MIXERS Barber-Greene Portable Mixers are available with capacities from 15 to 200 tons per hour. All features and certain B-G basic advantages of concrete mixers. Continuous operation, continuous mixing, no stops, no waiting, no time lost. All mixers are built with the latest in mixing and mixing equipment. All mixers are built with the latest in mixing and mixing equipment. All mixers are built with the latest in mixing and mixing equipment.



B-G DRYERS Barber-Greene Portable Dryers are available with capacities from 10 to 120 tons per hour. Features same the dryer model and the features of the aggregate. Each B-G Dryer has a highly developed system for handling, mixing, drying, and storing aggregate.



B-G DUST COLLECTORS Barber-Greene Portable Dust Collectors are available in sizes to meet every requirement for dust control and plant output. Know exactly re-



B-G GRADATION CONTROL UNITS Barber-Greene Portable Gradation Control Units for producing 2, 3 and 4 aggregate mixes, and available for B-G Plants with capacities from 40 to 120 tons per hour. All features many gradation and the many other B-G control provisions.

B-G BITUMINOUS PLANT ACCESSORIES

- 1, 2 or 3-bin hoppers • Reciprocating feeders • Feeder housing or charging hopper • Fines feeder with screw conveyor
- Charging and discharging belt conveyors • Cold elevators • Bucket Loaders for Travel Plant service

send for authoritative B-G information

Complete files of performance data and explanatory literature on the size and type of Barber-Greene Mixing Plant which interests you are available at your request. As a preliminary to thorough discussion of your needs with Barber-Greene experts, send for this information. When writing, specify type of mixes, plant output, etc.



OR WRITE BARBER-GREENE COMPANY, AURORA, ILLINOIS, U. S. A.

HOT BITUMEN FROM TANK-CARS

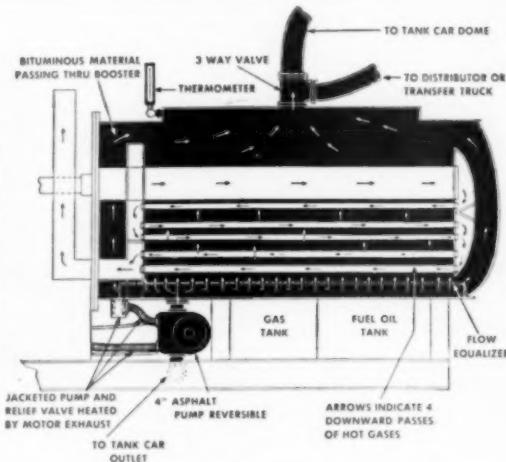
4 times as fast with



a Cleaver-Brooks PORTABLE PUMPING BOOSTER

The inside reason for fast operation:

Cleaver-Brooks Pumping Boosters pump, heat, and circulate bituminous material in one operation. Heating is provided directly, without use of steam, by pumping from tank-car (or storage tank) through the heating element of the Booster and back into tank-car. Entire contents of tank-car need not be heated as in one pass through the Booster, bituminous materials are heated to application temperatures and delivered to distributor, transfer truck, or storage tank; circulation of material while heating prevents separation and assures uniform application. No water or steam required for operation.



Send for bulletin
"Cleaver-Brooks Pumping
Boosters" for complete
information and
specifications.

Built by the pioneers and originators of pumping boosters:

Cleaver-Brooks Pumping Boosters are available in two sizes (No. 1 heats 10,000 gal. car 35° — 45°F. per hour; No. 2 heats 10,000 gal. car 55° to 65°F. per hour); both sizes obtainable skid-mounted or trailer mounted. Cleaver-Brooks are pioneers and originators of pumping boosters and tank-car heaters — have designed and built this equipment for more than 20 years — many original models are still in action — rendering efficient service.

Get complete information — send for bulletin

CLEAVER-BROOKS COMPANY
388 E. Keefe Ave., Milwaukee 12, Wis.

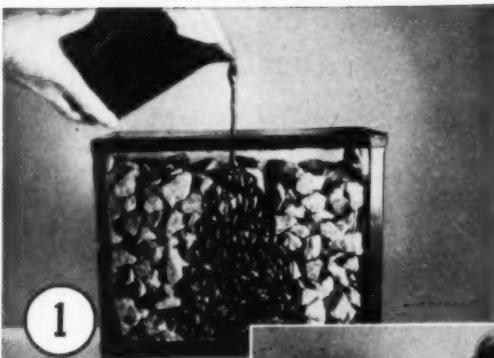
BUILT WITH THE FAMED
FOUR-PASS HIGH EFFICIENCY DESIGN OF

Cleaver-Brooks
STEAM BOILERS



Your 3 Basic Paving Problems

Solved BETTER by
Bitumuls
REG. U. S. PAT. OFF.



It PENETRATES—

uniformly and deeply—without heating—through closely interlocked stone, damp or dry. In macadam construction, this means **STABILITY** because BITUMULS tacky asphalt coatings leave the stone in frictional contact.



It COATS DAMP NATIVE MATERIALS—

Only BITUMULS mixes easily and uniformly with damp, dense materials. Nothing else so efficiently treats low-cost sands and native aggregates—and gives early pavement stability with year-round high bearing value.



It SEALS—

with precision—the **RIGHT** amount at the **RIGHT** place. This ease of precise cold application gives unsurpassed uniform, non-skid surface treatments with maximum retention of cover stone.

Whatever your paving needs, they can be filled by a correct BITUMULS specification that has already proved effective many times elsewhere. Our service engineers, skilled in the needs of your area, are ready to help **YOU**. Wire, phone or write our office nearest you.



Ask for these **FREE** booklets—data, tables, specifications.

In the East

AMERICAN BITUMULS COMPANY

200 BUSH STREET • SAN FRANCISCO 4, CALIF.
Washington 6, D. C. • Baltimore 3, Md. • Perth Amboy, N. J.
Columbus 15, O. • St. Louis 17, Mo. • Baton Rouge 2, La.
Mobile, Ala. • E. Providence 14, R. I. • San Juan 23, Puerto Rico

In the West

STANCAL ASPHALT & BITUMULS COMPANY

200 BUSH STREET • SAN FRANCISCO 4, CALIF.
Los Angeles, Calif. • Oakland 1, Calif.
Portland 4, Ore. • Seattle, Wash. • Tucson, Ariz.

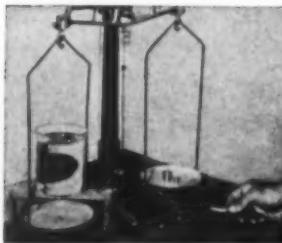
Ask for our **BITUMULS BOOKLETS**. They are factual, illustrated, and helpful—a valuable addition to your engineering library.

Bitumuls Penetration Macadam	..	<input type="checkbox"/>
Bitumuls for Maintenance	..	<input type="checkbox"/>
Bitumuls Sand-Mix	..	<input type="checkbox"/>
Bitumuls Handbook	..	<input type="checkbox"/>
Hydrosol—Admix for concrete	..	<input type="checkbox"/>
Tennis Courts—Laykold & Grosslex	..	<input type="checkbox"/>
Fibrecoat—roof and metal coating	..	<input type="checkbox"/>

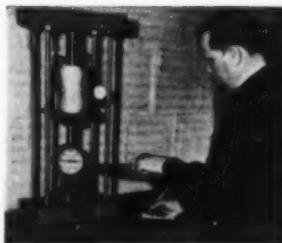


- How absorptive will compacted subgrade soil be?
- How thick should base course and wearing course be?
- Will local aggregate make a satisfactory base course material?
- What will spring thaws do to the paving?

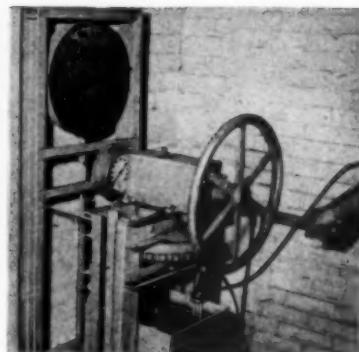
For better roads...let us "build" them first...in Ohio Oil's Modern Laboratory



Will local aggregate make a proper asphaltic mix? Specific gravity and voids-ratio analysis are made on a 2-inch asphalt mix briquette.



How will subsoil stand up? A soaked soil briquette is tested in a California Bearing Ratio Stability Machine to find out.



How strong will the paving mixture be? A Hubbard-Fields Stability Machine determines the shear strength of the compacted mix.

TO INSURE BETTER ROADS in 1951, you need the answers to plenty of engineering problems. And you can get these answers by having Ohio Oil's skilled technicians "build" your roads and reproduce your local conditions . . . in a laboratory completely staffed and equipped to give the best service to our customers. Write, wire, or phone for help on your problem, today.

This 15-state area is served by Ohio Oil—
a major source of asphalt for 26 years



The OHIO OIL Company • Asphalt Department

FINDLAY, OHIO • LOVELL, WYOMING • Producers of Petroleum since 1887



Scenes such as this eloquently depict the frost damage suffered last spring on Ohio's roads. Highway 6 across the state between U.S. 30 and U.S. 20 suffered the more because of heavy trucking on roadbeds not originally designed for such traffic.

Contractors Help Repair Ohio's Spring Road Damage in \$3 Million "Quickie" Program

Under special ruling, jobs awarded as Purchase Orders without plan sheets, in high-speed effort to augment maintenance forces. Four types of bituminous placement used.

FOLLOWING the severest winter and spring road damage in Ohio's history, the Ohio department of highways took emergency steps to erase the worst of the destruction. Highlight of this effort was the cooperation of the state's highway contractors, and the dispatch with which they took on and handled some 3 million dollars worth of unforeseen work.

Under a special ruling by the Ohio state board of control, the legally required procedure of awarding contracts on 30 days' notice through the highway department engineer of sales, was dispensed with. Instead, the jobs were posted only 10 days, and awarded as purchase orders, without plans and with only brief procedure outlines and material specifications.

This program, added to the large force-account maintenance program, brought to around \$12 million the cost of spring road maintenance and repair work in Ohio, contrasted with a normal \$1½ million. Following a bad winter which required \$4 million in snow and ice control work, or double

normal, this effort has dug seriously into state road funds in Ohio, where a record-breaking \$56 million state road construction program had been planned. About 375 miles of state primary and secondary roads were included in the "Quickie" contract program, the individual sections ranging from 0.5 to 26 miles in length. There were 185 separate contracts.

Intermittent or patchwork methods were specified, to be performed at locations as directed by the engineer, rather than a general or complete application over the entire section. As a result of thorough advance planning and proper briefing of the contractors, this type of operation has been handled with good efficiency. Most of the contract work was completed by late June, and the Ohio traveling public rescued from a rather serious and widespread emergency.

Trouble Began Early

The picture began to look bad for Ohio road conditions by midwinter, as a result of the once-in-a-lifetime bliz-

zard late in November, followed by sub-zero weather alternating with winter thaws and rains. The break-up began late in February, and reached an alarming state by March, when many roads carrying heavy traffic developed frost boils and pot-holes, or travelled and generally disintegrated. While in general the roads that suffered severe damage were older, inadequately constructed ones, some more recently built sections also showed distress. A survey indicated an estimated \$12,000,000 to \$15,000,000 in ultimate roadbed damage.

During February roads were extensively posted, under a state law which permits the highway department to limit gross axle loads during periods of excessive moisture or melting frost. Many roads remained posted until April 20, May 1 or even May 10 in the northern part of state. Enforcement, however, proved almost impossible despite the effort of the all too few weighing station and mobile load-meter crews.

By March 15 state highway maintenance leaders realized that labor shortages would hinder an all-out repair program by state forces, since state highway labor rates are below the rates offered by industry and the work staff could not be properly



manned. Equipment on hand also was insufficient to do the triple-sized job at hand.

Division offices of the highway department compiled lists of repair sections and a priority program was adopted. Then following approval to award contracts by purchase order, an initial letting was held April 23. About \$2,000,000 worth of jobs were taken up and bidding was spirited. On May 3 an additional \$1,000,000 of jobs were awarded and subsequently a third letting was held.

A feature of this program was the cooperation between highway officials and the Ohio Contractors Association, whose members agreed to tackle this substantial volume of unforeseen work at a time when they were either preparing bids on other jobs or getting started on work already awarded.

★ A 1-layer cold-mix machine-laid section, immediately after completion by contract—one of several hundred sections of primary and secondary state roads restored in Ohio during May and June.

Drag Patching—Hy. 161 Cunningham & Wise, Contractors

★ This contractor, of Granville, O., employed a Barber-Greene plant consisting of a No. 846 mixing plant, No. 363 belt conveyor and No. 358 under-car unloading unit to produce cold mix for one-course machine-placed random patching. Project length 6.72 miles of Hy. 161 farm-to-market road in Licking County. B-G finisher and Galion tandem roller. Note signs for one-lane flag controlled traffic through job

road sections ready for the surfacing operations of the contractors.

Four Job Types

The contract maintenance work fell generally into four classes, briefly outlined as follows:

(1) Drag patching, which usually consisted of a bituminous prime and tack coat, Ohio specification T-30, followed by a road mix surface course, T-32. A typical job called for applying .10 gal. per sq. yd. of RC-3 or RC-2 or similar bituminous material with sand cover, to cover spots or areas designated by the engineer; followed by a road mix or travel plant course of material of varying character, as deemed best for the particular location. RC-2 or RC-3 or other suitable bituminous material was mixed with acceptable crushed aggregates, the liquid asphalt ranging from .58 to .70 gal. and the stone from 66 to 86 lb. per



BITUMINOUS ROADS AND STREETS

sq. yd., with suitable amounts of choke stone rolled in.

(2) Seal coat or single surface treatment. This type of correction was selected for roadway areas where the base condition was good but the surface had "alligatored" or developed a fine crack pattern, showing need for addition of new bitumen. An RT-2 or RT-3 prime and a seal with RT-8, RT-9 or RT-10 were included in a typical job, along with 20 lb. per sq. yd. of cover stone. The existing surface was sometimes scarified, pulverized and reshaped prior to these applications depending on the road condition.

(3) Reconditioning, with addition of new aggregate. This class of work, required for sections where base reinforcement was seen to be advisable, included scarifying, pulverizing and reshaping of the old roadway, thorough mixing with mechanical rotary type mixers or travel plant, spreading and compacting at optimum moisture, compaction in 4 in. compacted layers being specified. A prime coat and a surface treatment then followed. Again, this work was not continuous,

but was performed at intermittent locations, as directed by the engineer.

Single Hot Mix Layer

(4) Hot mixed asphaltic concrete, or Ohio specification T-35 high-type mix, was employed on some of the most important and heavily traveled roads where this type of surface was justified and the base conditions were good enough to warrant investment in a more permanent overlay. A single 1 to 1½ in. layer of T-35 was machine laid along sections indicated by the engineer. A tack coat preceded this application.

Much of the betterment work involved in the above operations could be considered an advance phase of more general resurfacing scheduled to be placed sooner or later by regular construction contract, as needed or as soon as funds are available. Other projects were designed principally to meet the immediate emergency. Any or all three phases of force-account spring maintenance, contract repair work, and contract resurfacing were

being scheduled as the district engineer deems best for a given situation.

The emergency program was slowed considerably by the shortage of aggregates that developed here and there at the height of the work. Also by a tapering off of interest by the contractors in the later offerings; in some instances the later jobs had to be re-advertised or were awarded to contractors who found it difficult to meet the June 1 deadline.

The afore described program, combined with the regular construction is expected to result in the highest volume of bituminous road work in Ohio's history this year. Hot-mix resurfacing contracts are expected to be totaling 475 miles of equivalent 20-ft. pavement.

T. J. Kauer is the Director of Ohio's Highway Department and the maintenance contract program herein described was carried out under the direction of C. W. McCaughey, Chief Engineer of the Bureau of Maintenance and Repair, in cooperation with the department's 12 division offices.

Another Typical Ohio Contract Repair Project

★ The Shelly Co., of Thornville, O., had contracts covering various sections of road near their home community. Intermittent areas were treated as follows: (1) On some sections (as pictured) seal and chips placed with various equipment, including Galion stone spreader, Galion roller, International KB-7 trucks with Hercules bodies. By working 8-hour day with no lunch stop, crew laid 498 tons in typical day, despite frequent jumps. (2) On other sections, cold mixed asphaltic concrete consisting of MC-4 and MC-6 blended and 100% crushed limestone, mixed and applied with a Hetherington & Berner motopaver. Diamond T truck in scene. Thickness 1 in. or more or about 80 lb. per sq. yd., depending on engineer's judgment; intermittently applied to designated areas. Buffalo-Springfield roller. Around 46,000 sq. yd. in this job. M. D. Brandon, foreman.



69



When you're racing time...

that Pioneer Edge



Job Facts

Entire quarry plant used by Sargent was engineered, designed and built by Pioneer. It consists of a primary unit with a 30" x 42" jaw crusher and a 42" x 14" apron feeder; a 40" x 22" triple roll crusher; a 4' x 10' three deck vibrating screen; two 20 yard bins and 95' of conveyor.

To maintain an average of 1300 tons per day for the job described, there were several days when over 1600 tons was produced. Crushed stone base was placed in two courses ... the first, dust or sand bound ... the second, penetrated with one gallon per square yard of 85-100 penetration asphalt.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

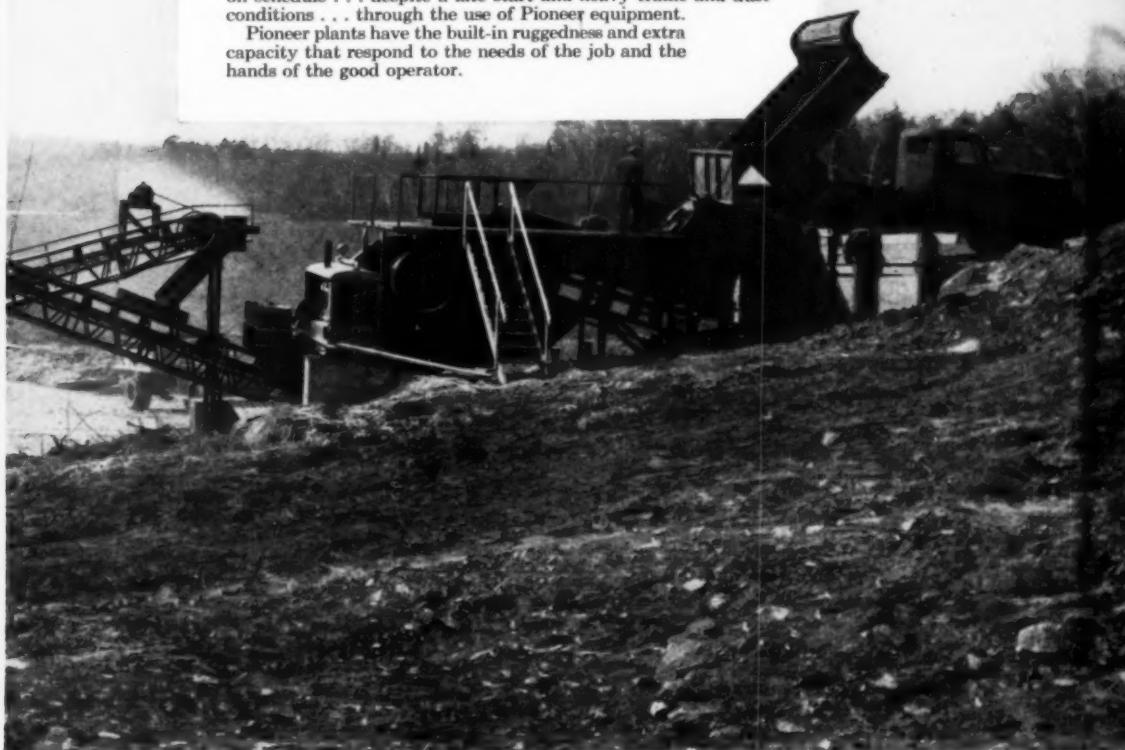
Pioneer
Continuflow EQUIPMENT

will help you win

Helps contractor make up for late start on Vassalboro-Winslow Project

LOST TIME often can be regained . . . when you have Pioneer equipment to help you out! H. E. Sargent, Stillwater, Maine, had from June 20 to August 16 to prepare the base for 9.14 miles of roadway. This required 37,000 tons of crushed stone, 42,000 cubic yards of gravel. It meant a crushing job averaging 1300 tons a day . . . producing four sizes of stone. This job was done and done on schedule . . . despite a late start and heavy traffic and dust conditions . . . through the use of Pioneer equipment.

Pioneer plants have the built-in ruggedness and extra capacity that respond to the needs of the job and the hands of the good operator.



HAVE THAT **Pioneer Edge** WHEN YOU BID

Who gets the job when bidding is close? The operator who can get the most in production per hour, per dollar, per machine, per man. Have that Pioneer Edge on your side! Send coupon for more facts and figures.



PIONEER ENGINEERING WORKS

1515 Central Avenue • Minneapolis 13, Minnesota

• Please send me information on the equipment checked.

<input type="checkbox"/> GRAVEL PLANTS	<input type="checkbox"/> WASHING PLANTS	<input type="checkbox"/> MECHANICAL FEEDERS
<input type="checkbox"/> ROCK PLANTS	<input type="checkbox"/> BITUMINOUS PLANTS	<input type="checkbox"/> VIBRATING SCREENS
<input type="checkbox"/> JAW CRUSHERS	<input type="checkbox"/> APRON FEEDERS	<input type="checkbox"/> BUZZER SCREENS (LIGHT DUTY)
<input type="checkbox"/> ROLL CRUSHERS	<input type="checkbox"/> ORO FEEDERS	<input type="checkbox"/> CONTINUFLLO CONVEYORS

Name _____

Company _____

Address _____

City _____

Zone _____ State _____



★ Completed pavement, U. S. 85 on edge of Raton, N. Mex.

Heavily Traveled New Mexico Highway Repaved With Hot-Mix Asphaltic Concrete

Notes on 7-mile project on U. S. 85 entering Raton Pass, New Mexico, W. T. Bookout Construction Co., Contractors

By **Ira B. Miller**

Project Engineer,
New Mexico Highway Department

and **J. D. Reese**

The Texas Company

THE project here described covered 6.98 miles of U. S. 85 immediately south of Raton, in northeastern New Mexico. Completed in 1950, it represents new practices designed to equip New Mexico's more heavily traveled highways for present-day weights and volume of traffic. The job is notably in contrast with asphalt oil road-mix methods used heretofore by the state as a successful means of providing a large mileage of surfaces quickly and with limited funds.

As a preliminary to paving, this reconstruction project included 309,000 cu. yd. of unclassified excavation, and 105,000 tons of ballast (spread 6 to 12 in. thick, depending on soil classification). A 3-in. leveling course was placed over all. Soil in place was compacted with pneumatic-tired and sheepfoot rollers.

The original contract specifications called for building the top 1 in. depth of this leveling course as a road-mixed asphalt base or processed prime, using RC-2. This base is 4 ft. wider on each side than the subsequent surface course. By the time the contractor got around to this part of the work,

however, road-mixing satisfactorily was almost impossible due to delays from the phenomenally wet weather and attendant cool temperatures of the 1950 season. Engineer approval was given to running material for this 1-in. course through the hot-mix plant set up for the surface course.

Moisture Improved Bond

The RC-2 material was already on hand and had to be used and accordingly some trouble was experienced in drying the aggregate because of the low temperature requirements of the RC-2. A further difficulty encountered with this switch-over to hot-mix was the matter of a satisfactory bond with

the leveling course, since under the original plan, calling for road mixing, no prime was necessary and none had been set up in the contract.

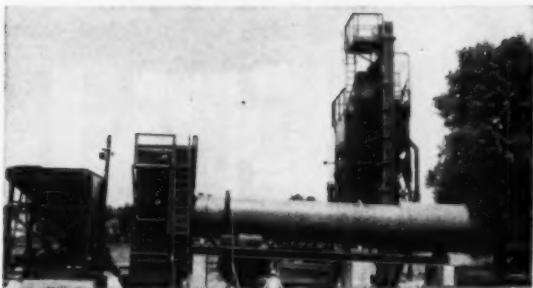
The solution by the project engineer was an interesting feature of this stage. After some experimentation, it was found that a satisfactory bond could be made with the leveling course if the upper part of this course held a small percentage of moisture. This desired moisture content was found to be near 3.5% and, while there could be no free water, the top one inch had to be moist enough to furnish a dust free-surface to receive the oil mix material. This phase of operations seemed to show that oil and water do have an affinity for each other under proper conditions.

The hot-mix asphaltic concrete sur-
(Continued on page 76)



★ W. T. Bookout's 3,000-lb. Madsen asphalt plant

Why Do We Say— "A CUMMER Plant Will Cut Your Costs... Increase Your Profit?"



Because CUMMER Portable Asphalt Plants Produce More—Faster—at Lower Cost!

The improved, big-capacity *Cummer Dryer* is fast-producing, exceptionally efficient... Cummer Portable Plants are easily transportable — can be completely assembled in as little as 12 hours... No chain or belt drives — all moving parts are individually motor driven... Cummer Plants are complete power units with vibrating screen, mixer, dust elevator, enclosed cold elevator, cold storage bin and feeder... Fired with oil or gas

burners... Can be powered with Diesel engines... Available in sizes from 60 to 100 tons per hour... Axles and pneumatics may be furnished... Cummer Portable Asphalt Plants lead the field for sensible, modern design, rugged construction, low operating costs and continuous, profitable production. With a Cummer you *maximize* output... *minimize* overhead! Write for a Cummer Catalog today.

THE F. D. CUMMER & SON COMPANY • CLEVELAND 14, OHIO
BUILDERS OF FINE ASPHALT PLANTS

The BEST... for more than One reason

- ADJUSTABLE
BRUSH TENSION
- SWEEPS IN
EITHER DIRECTION
- LIGHTWEIGHT
MONO-FRAME
CONSTRUCTION



LITTLEFORD ROAD BROOMS

When you're putting your money on the line for new Road Equipment, naturally you want Value received. Where can you get more for your dollar than investing in a Littleford Road Broom? Here is the only Road Broom with Patented Hydraulic raising and lowering system; this arrangement saves dollar upon dollar in brush replacements. The tension on the brush can easily and simply be adjusted to the road surface which reduces brush wear. This is only one of the many features found on either the Engine Driven Broom, or the Traction Driven Broom. Remember the LB sign means Littleford Bros. and Lower Budgets for the best Road Equipment.



LITTLEFORD

LITTLEFORD BROS., INC.

454 E. Pearl St., Cincinnati 2, Ohio



MANUFACTURERS OF

"Spray Master" Pressure Distributors—101 Utility Spray Units
"Spray King" Pressure Distributors—"Kwik-Steam" Vapor Generators
"Vari-Packer" Rollers—"Tankar" Heaters—Road Brooms—Tar Kettles
Emulsion Sprayers—Trail-O-Rollers—Supply Tanks—Asphalt Tools

LIFELINES

THROUGH LOW-COST AGGREGATE

THE vast networks of American railroads and highways are the arteries of the nation, carrying the output of factories, farms, mines and forests, providing the lifeblood for national security and progress.

America on wheels rolls on aggregate . . . hundreds of millions of tons of aggregate that must be produced at the *lowest possible cost per ton* for UNLIMITED CONSTRUCTION of the high speed roadways so urgently needed.

Cedarapids equipment provides American contractors with the means to keep aggregate production costs at lowest levels . . . consistent big volume output, long-life construction, low operating and maintenance costs, and high quality finished products that meet exacting specifications.

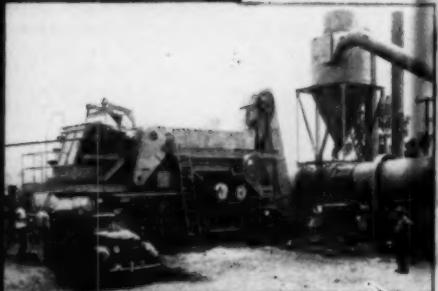
Cedarapids equipment brings OPPORTUNITY UNLIMITED to *you* with bidding advantages you can depend on to beat competition. For complete plants or single units . . . for producing either aggregate or black top . . . see your Cedarapids distributor for details.



IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

UNLIMITED

THE UNITIZED PLANT
fits all aggregate requirements! The four basic units . . . primary crushers, screening units, secondary crushers and wet or dry screening units . . . can be used alone or in any combination to produce anywhere from 25 to 250 tons per hour, and more, of any type of aggregate, from riprap to asphalt.



MODEL "FA"
The most portable of the line's line of bituminous mixing plants, the Model "FA" is quality built for accuracy of mix and low cost operation on a big variety of work. There's a size and type of Cedarapids plant for every black top job . . . the Model "B" for the biggest to the Patchmaster for the smallest.

Photo by Bruce Ballou

THE IOWA LINE of Material Handling Equipment Includes: ROCK AND GRAVEL CRUSHERS *

- BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS
- * FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS
- REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS
- HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

BITUMINOUS ROADS AND STREETS

(Continued from page 72)

face course was placed 24 ft. wide for about five miles on the south end of the job. At the north end, extending 9,000 ft., the design included a boulevard section, with roadways on either side averaging 24 ft. wide but with additional lanes for deceleration and acceleration at a number of the cross-over intersections. This boulevard section is lighted with mercury vapor lamps on high standards of graceful design within the city of Raton. Concrete curbs, designed for easy drive-over with 12 in. top and bottom radii, enclose a 16 to 30 ft. median strip.

Heavier Grade Used

The asphalt cement used in the hot-mix surface course was of 85-100 penetration which is unusual for this western country, where softer asphalts are the rule. This course was built to a compacted thickness of 1½ in. securing a tight composition of uniform texture. Following is a typical aggregate grading:

Opening	1/8	1/4	3/8	1/2	#4	#10	#40	#80	#200
% passing	100	93.6	75.2	50.8		41.9	25.7	13.1	7.4

The asphalt percentage of the total mix was set at 6.3.

The Marshall method and equipment were used by the bituminous engineer on the project for field design and control, subject to the approval of the state highway laboratory. Average stability obtained was 1,500 and the flow was 15. Samples taken by means of rings laid in the pavement were checked, and rolling was carried on until about 96-97% of theoretical density developed.

A new Madsen 4-bin, 3,000-lb. batch plant was set up for the job. It was powered by two diesel units and a Clayton steam generating unit furnished steam for the burner on the drum, for heating the storage, for



★ On W. T. Bookout Construction Company's U. S. 85 project, one of several projects built in 1950 under New Mexico's new specifications. Admum paver

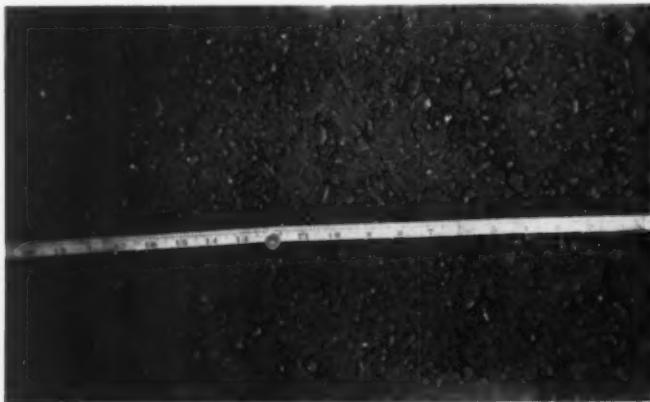
operating the ram on the mixer gate, and the jacket on the mixer. A generator set furnished power for pumps and lights. The pavement was laid by

an Admum paver operated at its slowest speed and plant batches were set at 2,000 lb. to match.

Compaction was performed with two 10-ton steel rollers. Aggregate was produced locally by the contractor with a Cedar Rapids crushing and screening plant.

Acknowledgments

The project was under the direction of Ira B. Miller, project engineer, with C. W. Johnson assisting as bituminous engineer on the hot-mix work. C. O. Erwin is district engineer for the New Mexico Highway department. For the contractor, W. T. Bookout Construction Company of Las Vegas, Ray Curtis had charge as superintendent, with Carl Willhoite as office manager.



★ Close-up of completed asphaltic concrete wearing surface; U. S. 85 job

Asphalt Research in California

The asphaltic-mix laboratory of the University of California Institute of Transportation and Traffic Engineering, at Berkeley, is engaged in investigations in soil stabilization and in the design of asphaltic-mix pavements. According to B. A. Vallegra in the Institute's *Quarterly Bulletin* the four principal investigations are as follows.

Soil stabilization with asphalt. As a first step, the effect of different climatic conditions on time of curing is being studied for eight different soils combined with a medium-curing liquid asphalt. Factors to be evaluated include the effects of sun, wind, moisture, and temperature.

The preparation and testing of asphaltic-mix specimens are still being studied as part of the Triaxial Institute Co-operate Research Program. Participating agencies prepare specimens and send them to the laboratories of the other participants for testing. By this procedure it is expected that the Triaxial group will be able to identify the differences, if any, between specimens prepared in the different laboratories and between test results obtained in the different laboratories on similar specimens. Other participants are Shell Oil Co., California Research Corporation, California Division of Highways, and U. S. Forest Service.

Methods and devices for forming laboratory test specimens are the subject of a separate investigation. One objective is the development of a simple kneading-type compactor for field use. Test specimens formed by various methods and with various devices have been compared by the Heem stabilometer. This work was reported

in a paper to the Assoc. of Asphalt Paving Technologists in February. Additional devices and methods remain to be studied, as well as the effect of varying sample size.

Durability of asphalt is the subject of a fourth investigation. Asphalts frequently fail to perform satisfactorily as a binder in pavements as a result of hardening with exposure and time. Equipment has been prepared for explorations into the causes of hardening. From the data so obtained it may be possible to develop criteria for suitable performance.

Asphalt Institute Appoints Griffith Research Chief

Bernard E. Gray, President of The Asphalt Institute, has announced the appointment of John M. Griffith, as Engineer of Research, with headquarters at the New York Office. Mr. Griffith succeeds to the post until recently held by Prevost Hubbard, retired, as head of the Institute Laboratory and field research.

Mr. Griffith received the degree of Bachelor of Science, Civil Engineering, from the University of Michigan. His background of training and experience includes first, work with the U.S. Coast and Geodetic Survey in the Mississippi State Highway Department on general highway planning. In Michigan in 1938 and 1939 he served as Office Engineer in the City Engineer's Office at Ann Arbor, and then for two years with Professor W. S. Housel in consulting work on soil mechanics and foundations at the University of Michigan. From 1941 to 1943 he was employed as structural designer in the Chief Engineer's Office of the New York Central Railroad in Chicago.

For the past eight years Mr. Griffith has been with the Flexible Pavement Branch of the Waterways Experiment Station at Vicksburg. This is a research branch of the U.S. Corps of Engineers operating directly under the Chief of Engineers, Department of the Army. Starting as a project engineer in charge of field research on soils and pavement projects, Mr. Griffith was promoted in November 1944 to Chief of General Investigation Section, handling all field research, testing, and certain analytical studies in the office; and was re-signed in October 1947 to Chief of Bituminous and Chemical Section, handling all laboratory research and a number of special projects of the Branch.

Mr. Griffith is an Associate Member, American Society Civil Engineers; Member, Association of Asphalt Paving Technologists; Associate

in Highway Research Board; and Registered Professional Engineer (Civil) in Michigan.

Patrols Compared With Maintenance Crews

By John C. Burnham

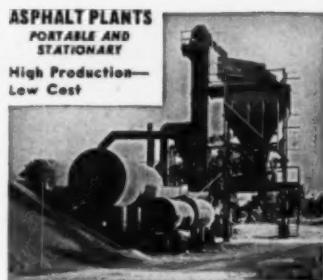
Assistant to Chief Engineer, Maine State Highway Commission, Augusta

(Published in "The Trail," official magazine of the Maine Good Roads Association.)

The Maintenance division of the State Highway Department, in seeking ways to reduce the cost of doing work, has in a few localities organized crews to take over the mileage

ASPHALT PLANTS PORTABLE AND STATIONARY

High Production—
Low Cost



THE McCARTER IRON WORKS, INC.
HORRISTOWN, PENNA.

HOPKINS Gives You

- ★ More Tonnage
- ★ Less Fuel Consumption
- ★ "Job-proven" Equipment



Hopkins Volcanic Dryer Unit

Contractors throughout the country have learned that Hopkins low pressure burning equipment steps up production, provides greater efficiency, and reduces fuel costs.

Hopkins makes the only complete "package unit" combustion system for asphalt plants—easy to install and operate, dependable, efficient, and adaptable to any dryer size or design. Why not get these money-saving advantages for your asphalt plant? Write today for literature and complete details.

Hopkins Volcanic Specialties, Inc.

Alliance, Ohio

McConnaughay

HEAT ACTIVATED "MULTI-PUG" ASPHALT MIXER



MODEL

HTD

CABLE: McCONN

The Patching Mixer
for Summer or Winter

HOT or COLD mixtures.
Unexcelled for patching.
Small jobs a cinch to
complete right on the
site.

McConnaughay
EMULSIFIED ASPHALT
PLANTS AND PROCESSES

K. E. McCONNAUGHAY • LAFAYETTE, IND.—U.S.A.

formerly repaired by several patrolmen and their helpers.

In general one of the new crews is expected to handle the maintenance work upon about 125 miles of highways. That mileage would be the equivalent or a little more than now handled by five average patrol crews.

Taking one of the crews now in operation as a sample it is found it consists of 1 foreman, 3 truck drivers, 5 laborers, 1 pickup truck and 3 two yard dump trucks. The combined salary and truck rental for this crew amounts to \$10.55 per hour. It replaces a crew of 5 patrolmen, 13 helpers and 5 trucks which were paid a combined cost of \$18.41 per hour. It can readily be seen there is a saving per hour of \$7.86 which would be good business if the new crew can produce as much work as the several small crews replaced.

Only a few such crews will be put into operation pending a careful analysis of results. If after a fair trial results prove the advantage of the larger crews then they will replace the smaller crews throughout the state.

The new crews are expected to be more efficient because the proper number of laborers will be available for loading truck or for other jobs requiring several men.

In comparison to the larger crews the patrol crew usually consisted of the truck, a patrolman and one or two or possibly 3 helpers. As the crew depended upon the patrol trucks for transportation the entire crew usually worked at the same point and upon the same task. Rarely does a patrolman put his helper to work upon one job and he drive on to some other point where he would find work to do.

It has been remarked time and time again that when a patrolman has more than one helper he then becomes only a foreman and truck driver. It has also been said that a patrolman working alone works full time, if he has one helper he works part time but if he has two or three helpers he becomes a non-working foreman.

There is no question but there are some grounds for criticism of highway patrol crews but on the other hand there are many hard working, honest patrolmen who give a good day's work and are earning their wages. These good-working patrolmen will be the ones who will form the larger maintenance crews and there is no reason why one of them should not be the foreman. The poor workers will be laid off and it will not be surprising if it is found that the ones who voice the loudest objections to a change will be those who will not be needed.

BPR Defines Construction Permit Requirements

In order to avoid any possible confusion regarding the agency which should handle applications pertaining to the commencement of highway construction projects, the Bureau of Public Roads has pointed out that its authority (by delegation of the National Production Authority and Secretary of Commerce Sawyer) extends to **all the actual construction, maintenance and operation of the highways themselves, including markers and other traffic control facilities.**

The general criteria which will be the basis for the issuance of road construction permits are: (1) The project is construction for the account of the Department of Defense, the Atomic Energy Commission, or the National Advisory Committee for Aeronautics; (2) The project furthers the defense effort by providing facilities of certain specific types; and (3) It is essential to maintenance of public health, safety, or welfare.

Application for authority to commence construction on a highway project should be directed to the District Engineer of the BPR in the state in which the project is located. When an agency other than the state highway department is in charge of the project, the application should be channeled through the state highway department for recommendations before being presented to the Bureau of Public Roads.

A permit to construct may be issued if the project is in one or more of the following specific classes of highways:

1. A legally certified access road.
2. A section of a route on the Interstate Highway System, urban or rural.
3. A section or a route which is inadequate and unsafe for the traffic volume and which cannot be kept in service without excessive costs including highway maintenance, vehicle depreciation and vehicle operation over a 10-year period. This requirement does not preclude a relocation and new alignment if necessary to provide adequate rights-of-way for more efficient operation.

Special cases and those involving commitments for large expenditures of funds and extensive use of critical materials and labor should be forwarded to the Washington office of BPR for consideration. Projects which require less than 25 tons of steel or are essentially maintenance in character do not require a permit to construct. However, any steel or other critical material required will be charged to a state's given allotment.

All proposed projects will use types of construction and design standards which require the minimum of critical materials.

Federal-aid projects which are subsequently submitted by the State for program approval should meet the criteria to the end that program approval will carry a commitment for approval of construction if acceptable bids are received.

On subsequent Federal-aid projects, applications for commencement of construction should be submitted to the District Engineer by the State with the plans, specifications and estimate for each project. If satisfactory, the formal letter authorizing commencement of construction should be issued by the District Engineer at the time the project is authorized for advertising.

Roadside Islands Built as Safety Aid

In the interest of both traffic safety and roadside beautification, the Kansas Highway Commission Division 1 has begun a program of island construction at suburban cafes and other roadside establishments. This work is being done near Topeka. The enclosed areas will make it possible for the motorist to differentiate between private entrances and state land. The belief is that channelization of large roadside expanses will help direct

traffic more positively in entering or leaving the main roadway, just as channelization helps eliminate driver confusion and reduce accidents at intersections.

Pictured here is a typical oval or circle, selected for landscaping with the property owner's permission. Since such areas are usually surfaced with stone or gravel, and well compacted, post hole digging was something of a problem. The power auger attachment on a small tractor made rapid work of post setting.

Perkins New Arizona State Engineer

R. C. Perkins, heretofore deputy state engineer of Arizona, has been appointed state highway engineer. He succeeds W. C. Lefebre, who resigned to accept the appointment of postmaster for the city of Phoenix, Ariz.

Correction

The article "Detroit's Assessment Street Program" appearing in May ROADS AND STREETS contained a typographical error, which we would like to correct. G. R. Thompson, City Engineer of Detroit, calls attention to the fact that we gave the cost of the 75 miles of paving done in 1949 at \$5,355,367, which should read \$71,500 per mile rather than \$871,500 as stated.



★ Posts set for an island along entrance highway near Topeka. The enclosure is to be grassed or planted with flowers. Landscape foreman Floyd Infield and maintenance foreman Howard Manley watching operation of power posthole auger

Control of Hot-Mix Asphaltic Concrete

In non-technical language the author reviews principles of asphalt pavement design and discusses the more important factors essential to a good quality job.

By J. Rogers Martin

Research Professor, School of Civil Engineering, Oklahoma Institute of Technology, Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma

THE first hot-mix asphalt pavement using petroleum asphalt was laid on Pennsylvania Avenue in Washington, D.C., in 1900. This sheet asphalt pavement was controlled strictly by trial and error, and incidentally, was a complete failure because the asphalt content was too high. From this beginning, more and more hot-mix pavements were laid with a constant improvement in the finished product. As time progressed, engineers, still working largely by trial and error, learned by hard experience the importance of asphalt content, of grading, and many other factors which contributed toward a successful pavement.

These early engineers were artists. Many of them learned to build good asphalt pavements by the same method that grandma baked a cake. Her units of measure were dashes, dabs, and pinches and she could bake a wonderful cake, but when she tried to tell daughter how to do it, the cake usually had to be thrown to the hogs. So it was with these old veteran asphalt men.

In the '20's a new breed began to emerge in the asphalt paving industry known as the laboratory research man. He followed the veteran around, observing his methods and analyzing his pavements with the objective of finding the keys and establishing rules for building a good pavement so that it would not be necessary for a man to have fifty years' experience in order to place one which was satisfactory. In this he was largely successful. Guiding principles were discovered and put into use through tests and specification requirements. They were called controls. Now from where did these controls come? They were not the result of so-called research men sitting at a desk and determining out of thin air just what would have to be done to make a good pavement. They were merely the reflection of the skill of the veterans in the field reduced to

definite figures and numbers. As a matter of fact, a statement of the principles of control and design could aptly be considered as a summary report of fifty years of field research in building hot-mix asphalt pavements.

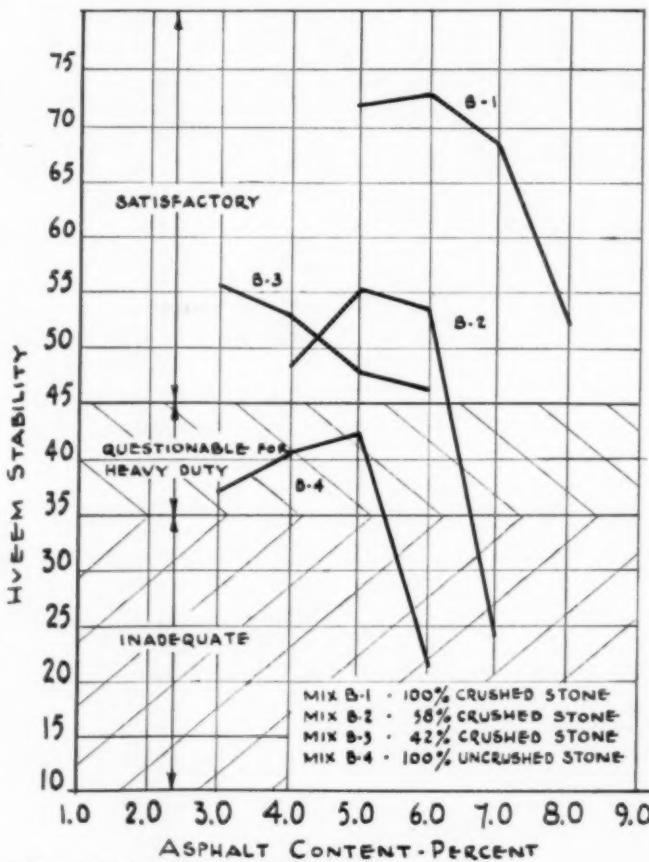
Principles Summarized

Now let us see what these principles are. Inasmuch as control is merely the design worked in reverse, let us consider the guiding principles in

design which have now been agreed upon by the major portion of the engineers in this country.

(1). The aggregate must be reasonably well graded. For instance, the commonly used mixes for surface course must have sizes all the way from about $\frac{1}{2}$ inch down to dust.

(2). Finished pavements must have a certain amount of air included in the mix in the form of air pockets or voids. Experience has shown that the voids should not exist in an amount of less than 2 percent nor more than about 6 percent. So taking the middle course, the designer sets the voids at 4 percent or, stated in another manner, he sets the mix at 96 percent



★ Figure 1. Effect of type of aggregate on stability

density. This is accomplished by making up several mixes in the laboratory with varying percents of asphalt, compacting them as they will be compacted on the road and then selecting the asphalt content which will give 96% density. Thus, the optimum asphalt content of the mix is established.

(3). Having decided on the exact grading and the exact asphalt content to be used, it is now necessary that the compacted mix be tested by some stability method to determine whether or not it will take the traffic to which it will be subjected.

(4). The use of extremely hard asphalts is avoided because the softer asphalts have a longer life. The old concept that the asphalt had to be as hard as a brick in order to obtain the necessary stability no longer prevails. It is now known that a much more important consideration in obtaining a strong stable pavement is the kind of aggregate employed in the mix. An illustration of this may be seen in Figure 1.

Figure 1 gives the design results of four different mixes. Each curve represents 4 different asphalt contents plotted against the percent Hveem stability. Any specimen, the results of which falls above the bottom hatched portion will have satisfactory stability for most purposes. In case of pavements subjected to heavy, frequently-stopping traffic, specifications usually require a minimum of 45 so that we may say that those above the second hatched portion are completely satisfactory for all pavements. Now each of these mixes has exactly the same grading but different types of stone were used in each case. Curve B-1 is 100 percent crushed limestone, B-2 is 59 percent crushed limestone and 42 percent sand. Curve B-3 is 42 percent limestone screenings and 58 percent uncrushed gravel. B-4 has no crushed stone, consisting entirely of gravel and sand. Now you will observe that the stability of the mixes represented by each curve drops progressively lower as the percent of crushed stone is decreased. Here is an important factor in any design. It would be an easy matter for the engineer to design a mix in accordance with the curve in B-1, 100 percent limestone. There would be little fear of obtaining an unstable mix and he could "rest at nights." Now what about the contractor's standpoint on these mixes.

Cost vs. Stability

As a general rule, we can say that stability costs money because the price of the aggregates usually decreases as the stability decreases. For instance, on this particular set of designs we

ELIMINATE THIS COSTLY ROAD "HOG" FROM YOUR NEXT SURFACE JOB...



Specify Non-Bleeding BITUCOTE RS-2 SEAL COAT

A "fat area" can prove to be a road "hog"—eating up your carefully budgeted maintenance dollars.

The best way to keep him off your road and street surfaces is to use BITUCOTE RS-2.

Because RS-2 grips quickly and firmly, it retains the proper amount of aggregate to provide a longer-wearing surface... eliminates costly "bleeding"...saves the expense of subsequent "blotting up" operations on the soft, slippery, fat areas.

Contact your Bitucote Representative soon... let him tell you about all the advantages to be had by using budget-stretching BITUCOTE RS-2 for surface treatment.

FREE BITUCOTE BULLETIN

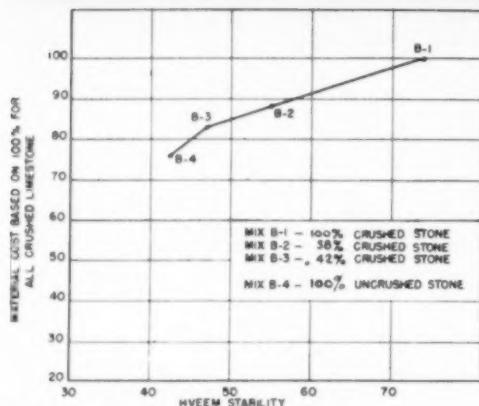
Get the complete story on Bitucote. Send for your copy of 4-page Bulletin: "PAVE IT BETTER WITH BITUCOTE"—illustrated information on use of Bitucote for Road Mix, Penetration, Plant Mix, Surface Treatment, Base Stabilization.

Bitucote
PRODUCTS Division of BRIDGES PAVING CO.

1411 CENTRAL INDUSTRIAL DRIVE • ST. LOUIS 10, MO.

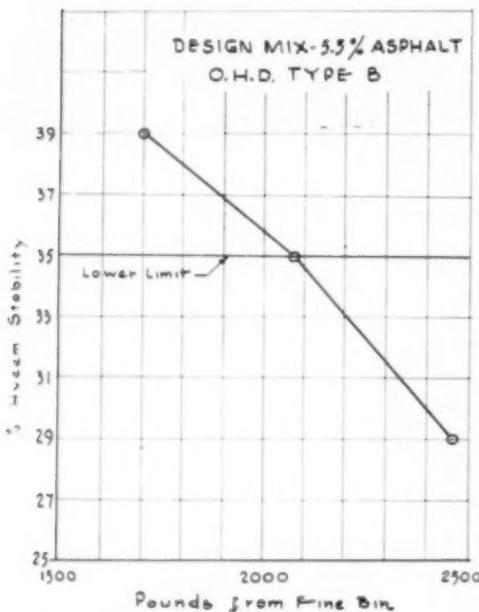
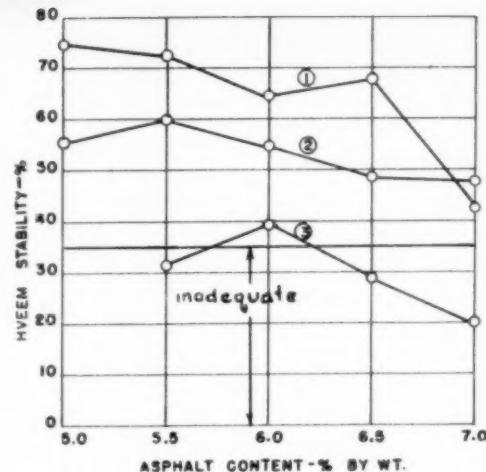
Plants: St. Louis, Mo. • Cincinnati, O. • El Dorado, Ark. • Butler, Ind. • Laurel, Miss.

BITUMINOUS ROADS AND STREETS



★ Figure 2. Relation of material cost to Hveem stability

★ Figure 3 (left): Aggregate portions contain: curve 1, 100% crushed limestone; curve 2, 60% crushed limestone and 40% sand; curve 3, 10% crushed limestone, 40% uncrushed gravel and 50% sand



★ Figure 5. Effect of grading on stability

have plotted material cost based on 100 percent for the all-crushed mix against the Hveem stability. This is shown in Figure 2. The use of mix B-2 will save 12 percent on the material cost over that for mix B-1. Mix B-3 will effect a savings of 17 percent and B-4 a savings of 24 percent.

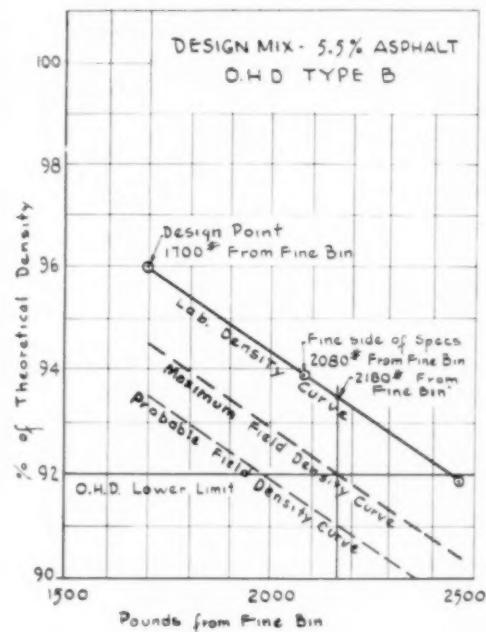
The curves in Figure 1 are very typical of the trend reflected in mixes with varying amounts of crushed

stone, but it should be pointed out that the mix containing no crushed stone showed a little higher stability than can normally be expected. Figure 3 represents a series of curves which are more typical of those ordinarily obtained.

Curve (2), Figure 3, is fairly representative of many of the mixes being used in Oklahoma employing crushed stone and sand. Also, curve (3) is fair-

ly typical of what is to be expected with little or no crushed stone in the mix.

The cost relation on these mixes are similar to those shown in the last figure so that curve (3) represents the cheapest mix by far. However, it is obvious from this curve that this mix is unsatisfactory due to the narrow range of asphalt content over which it will have 35 percent stability or



★ Figure 4. Effect of grading or percent density

more. This statement applies to the accuracy of control which we are actually able to obtain in the field as of 1950. At some future date when the contractor and engineer working together have perfected control to a fine point, such a mix can be used safely with a resultant savings in cost.

Now let us consider plant control on the job. Actually plant control is nothing more than a matter of seeing that the mix is made in accordance with the established design. Minimum tests are extraction, grading and density tests. The extraction gives the asphalt content and the grading.

Importance of Gradation

I believe it is unnecessary to point out here the importance of holding the asphalt content within the design limits because every engineer and contractor is familiar with the fact that an excess of asphalt will invariably result in shoring, bleeding, or rutting; whereas, a deficiency of asphalt invites raveling and loss of life of the pavement. However, I believe the average engineer and particularly the contractor underestimates the importance of close control of the grading. The most serious damage results when an excess of material from the fine bin is added.

In an effort to illustrate the results of this, we have prepared a series of mixes with various amounts of fine aggregate in the mix and determined the density and stability on each of them.

Figure 4 gives results of these mixes with pounds, from the fine bin, plotted against the percent density for the mix on the basis of a 4000-lb. batch.

The design asphalt content of the mix is 5.5% with an aggregate consisting of 55% limestone and 45% sand. It was estimated that it would require 1700 lb. from the fine bin.

The solid curve represents the densities obtained on the laboratory specimens, which were molded by the gyratory method. Under the most favorable conditions, the corresponding densities obtained in construction, immediately after rolling is complete, will rarely exceed the values represented by the dotted curve, "Maximum Field Density." Under average conditions the field density will approximate the values represented by the dotted curve, "Probable Field Density."

Now insofar as grading specifications are concerned, an extra 380 lb. (2080 lb. total) may be added from the fine bin without violating specifications, but what about the field density? The contractor can obtain the minimum of 92 percent only with long and heavy rolling under ideal condi-

"new standard" Jaeger Compressors



Why starve your modern air tools with "old standard" compressors that have not increased their air output in 19 years? Jaeger Air-Plus standards provide the increased air you need to power today's tools at their full efficiency—at the lowest cost per foot of air of any compressors on the market.

See your Jaeger distributor or send for complete Catalog

THE JAEGER MACHINE COMPANY

223 Dublin Ave., Columbus 16, Ohio

PUMPS • MIXERS • HOISTS • TRUCK MIXERS • PAVING MACHINERY

tions. If an excess of more than 480 lb. (2180 lb. total) is added, he cannot obtain minimum field density by any amount of rolling.

Stability Also Lower

If reduction of field density were the only result of excess fine bin material, the matter might not be of great importance. However, it also results in a reduction of stability as shown by Figure 5. The immediate effect of reducing the stability is manifested by increased difficulty in rolling the pavement out to the "pool-table-smooth" surface which came rather easily while the mix was being proper-

ly proportioned. This is because the mix becomes progressively "squashier" as the stability is reduced. The resultant weakening of the pavement to the resistance of traffic needs no discussion here.

Another factor in the plant control is the temperature. It is common knowledge that overheating of the asphalt or stone is not desirable and most specifications limit the temperature to 300° F. as the mix comes from the pug mill; however, I believe that this matter of keeping the temperature as low as possible is probably overworked in some cases. It should be remembered that an asphalt which

is working satisfactorily at a given temperature, say 265° F. may not work satisfactorily when the weather cools off. Trying to work with a mix too cool is one cause of cracks appearing immediately behind the finisher and this should be taken into account. Also, it should be remembered that the temperature shown on the recording thermometer is not the governing temperature because there will usually be a drop of 15 to 20° F. between the end of the drier and the pug mill. The controlling temperature is that shown on a thermometer stuck into the mix after it has been placed in the truck.

Field Control Factors

So much for plant control. Assuming that plant control has been satisfactorily carried out in every detail, the pavement can still be a sore disappointment if the field control is inadequate. Among others, there are two outstanding points. (1) The material must be well compacted and (2) a pavement must be obtained that has a smooth surface without waves and irregularities. If the contractor makes an honest effort to obtain good compaction and has adequate rollers there will usually be no difficulty in meeting density requirements. As a general rule, a portion of a hot-mix pavement which will not come up to the density requirements can be detected without running a density test. Such places most commonly occur at an inaccessible point and they can be spotted by the observation of roller creasing and a little heel stomping. Of course, density tests are important and at least one day should be run to ascertain that density requirements are being met, because it may be seen from some of the preceding discussion that inadequate density may result from causes other than inadequate rolling.

In the matter of obtaining a smooth surface, I am a strong believer in obtaining such a surface as early as possible. By this I mean a pavement laid over a gravel or a crushed stone base should not have the first course placed until the base is smooth and solid. If this is done, particularly with the use of the mechanical finisher, the surface will pretty well take care of itself. I believe that men are few and far between who can operate the screws on a finisher to take out irregularities in the foundation. This temptation of the finisher operator seems to exist in most resurfacing operation over an irregular base. A much smoother course may be obtained by leaving the screws alone and throwing material back in the depressions and levelling off by raking the first course.

NO TIME LOST! LOADING OR LAYING ITS LOAD



A STANDARD STEEL
PRESSURE DISTRIBUTOR
GIVES EQUAL CIRCULATION
THROUGHOUT
THE SPRAY BAR FOR A
UNIFORM SURFACE
FROM CURB TO CURB
FOR LONGER WEAR

OTHER PRODUCTS OF STANDARD STEEL

Maintenance Distributors, Tar
Kettles, Patch Rollers, Supply
Tanks, Tool Heaters, Asphalt
Tools, Street Flushers, Construc-
tion Brooms.

STANDARD STEEL PRESSURE DISTRIBUTOR

The Model 424 can be loaded in quick time for a "fast get-away". A two-way cleaning system guarantees a clean spray bar at the end of the day. First, the material is sucked out of the bar and back into the tank. Then by turning one small valve, cleaning solvent is released into pump and spray bar (without contaminating the asphalt in the tank). No time lost in tinkering — no time lost in loading — Standard Steel 424 keeps going all day long far ahead of the "gravel gang".

WRITE FOR CATALOG 424

Built to the Highest
Standard SD-1

Standard Steel Works NORTH KANSAS CITY, MO

The fact that raking causes some segregation and an unsightly surface in the base course is without significance because the even surface it produces will make it unnecessary to do any raking in the surface course.

The foregoing article is based upon a paper presented before the last meeting of Division No. 4, The Asphalt Institute, at Oklahoma City.

Kentucky Changes Its Test Procedure

A change in the effective date of a rule permitting use of bituminous materials before completion of tests by the department laboratory has been announced by the Kentucky state highway department.

The rule provided that:

"In order to prevent the delay of the movement of tank cars and other bituminous transportation equipment, it shall be the policy of the Department to permit the use of bituminous materials before representative samples of such materials have been tested and approved by the Department Laboratory, provided that any bituminous material so used, which fails to meet the requirements of the Department's specifications and contract after it has been sampled at the point of destination and tested by the Department Laboratory, be paid for, based on the Department's estimate of its actual value to the Department. This value shall be established in a percentage basis of the cost of the material under the terms of the contract at the point of destination by a committee appointed by the State Highway Engineer.

"Materials consigned to Highway contractors and used on the Department projects shall be subjected to the same provisions as if it had been shipped to the Highway Department for use of their own forces."

"Bituminous materials received and unloaded and placed in bituminous storage tanks, which fails to meet the requirements of the Department's specifications but which has not been used, shall be paid for on the same basis as material which has been used, as set out above, except that in the case of contractors' shipments, if the contractor does not properly empty and clean his storage tanks of other types of bituminous materials or of foreign materials no payment will be allowed."

The new rule became effective for all invitations and proposals on and after April 18 for purchases of bituminous materials by the department of highways or its contractors.

The rule also provides that it will not be necessary for the supplier to

furnish a certified analysis but in all cases a certificate of gallonage and type of material will be required.

Bituminous Cover Scene

The Bituminous Roads and Streets cover this month (p. 59 in this issue of ROADS AND STREETS) shows a progress scene on the New Jersey Turnpike. A forthcoming article will give interesting details of this million-ton asphalt paving project. The contractors were granted permission to dispense with side forms in placing the 4½-in. hot-mix asphaltic concrete surface. Three 1½-in. layers instead of

two thicker layers are being placed, representing another specification change, made in the interest of securing greater smoothness in the top lift. The tolerance of $\frac{1}{8}$ in. in 16 ft. reportedly is being met with no special difficulty.

Asphalt Institute Moves Division Office

Lyle W. Walker, vice president, Division II, The Asphalt Institute, announces that the Division II office has been moved from 431 Main Street, Cincinnati 2, Ohio, to 8 E. Long Street, Columbus 15, Ohio.



Resurfacing costs cut approximately 50%

In these days of increasing costs, equipment that will save money is certainly worth investigating. Middlesex County, in Canada, investigated the Moto-Paver and decided to use it on their 1950 road resurfacing program. When the program was completed it was found that the costs were approximately 50% lower than they would have been if the work had been done by conventional methods.

We make no claims that Moto-Paver will save you 50% on your resurfacing costs. But we do say—based on Moto-Paver performance records under all kinds of conditions, that no other machine or method produces comparable results at comparable cost.

Bulletin MP-49 will be sent on request.



HETHERINGTON & BERNER INC.

Engineers—Manufacturers

721 KENTUCKY AVENUE

INDIANAPOLIS 7, IND.



★ Two trucks and their crews are combined here for rapid, intensive patching on U. S. 20, New York [Roads & Streets Photos]

Early Patching Helps New York Roads through "Worst" Spring



★ Additional views of the double crew, which performed broomed torch application, raking and tamping. Note safety rails on trucks, for protecting workers in transit. Also spotlight on back of frame, to aid working in winter twilight

ROADS AND STREETS, July, 1951

WHAT'S BEHIND THE EUCLID NAME?



Loader and Bottom-Dumps—an efficient team!



Euclid Scraper... 15.5 cu. yds. struck... 275 h.p.



15-ton Rear-Dump... semi-rigid or spring mounted drive axle.

A pioneer in the development of earth moving equipment, all of Euclid's production and service facilities have always been devoted to specialized equipment for off-the-highway work.

Features that have made "Eucs" the choice for hundreds of mining, construction and industrial jobs — long service life... high speed and large capacity... and dependable performance — assure high production at the lowest cost per ton or yard moved.

There is a Euclid model to meet every requirement for off-the-highway hauling of earth, ore, coal, or rock... and body designs for all types of materials.

Have your Euclid Distributor show you how Euclid job-proved equipment can lower your hauling costs, or write for literature on current models.

The EUCLID ROAD MACHINERY CO.
CLEVELAND 17, OHIO

**MORE LOADS PER HOUR—
MORE PROFIT PER LOAD**

EUCLID'S



quent spaced repairs. The double crew consisted of a foreman, two truck drivers, two shovels, two heater operators, and two rakers who also did tamping. The rakers also took turns brooming water out of the cracks and depressions and swabbing the surfaces to be patched—note that heavy melting is in progress.

Safety Rail Used

A feature on the trucks is the use of pipe railing, installed in the department's maintenance shop for the protection of the crewmen while riding or working up in the truck. Immediately behind the cab on each truck, also note



DARAKOTE

bituminous materials to adhere to wet, moist or dry aggregates... prevents stripping under adverse conditions of moisture and low temperature.

DARAKOTE

SURFACE TREATMENT

With **DARAKOTE**, surface treatment goes on uninterrupted, rain or shine, no matter if aggregate and old road surface are drenched, damp, or bone dry.



TRAVEL PLANT MIX

DARAKOTE adds working days to your paving season. Asphalt maintenance and paving programs continue as scheduled, costly delays are eliminated.



**Dewey and Almy
Chemical Company**

**anti-stripping additive
makes it possible for liquid**

bituminous materials to adhere to wet, moist or dry aggregates... prevents stripping under adverse conditions of moisture and low temperature.

**actually displaces water,
it binds asphalt to the
aggregate and to the road
surface.**



ROAD MIX

With **DARAKOTE**, less blading and mixing is required—often aerating and drying out windrows is accomplished in half the time. Demurrage and standby time is reduced.



PLANT MIX

DARAKOTE is more effective at all working temperatures. It retains its effectiveness under heat, will not settle out or deteriorate in processing, storage, or use.

Cambridge 40, Mass. Chicago 38
San Leandro, Calif. Montreal 32

★ Cold pre-mix purchased commercially is stockpiled at strategic points and loaded into trucks with belt loader units or other mechanical means

the wooden box built to shelter men while traveling.

The ROADS & STREETS editors were unable to secure any official information from the Binghamton district on the methods used in such patching.

However according to William Robinson, district engineer at Syracuse, which also has a section of U. S. 20, his district for several years has done early-season cold patching with a commercially prepared asphaltic concrete mix ($\frac{1}{2}$ -in. max.) made with a medium-cure cutback asphalt to which a wetting agent has been added at the refinery. This mix is prepared in the autumn before the plants close for the winter, and stockpiled either at the plants or at locations selected by the highway department. The wetting agent is used to improve adhesion under adverse weather conditions. This mixture varies in its ability to perform under such adverse conditions, but the reasons for the variations as yet are not clearly understood according to Mr. Robinson.

3300 Tons of Mix

Such patching is designed to serve until weather conditions permit more durable work. About 3300 tons of patching mix was used during the 1949-50 winter and spring.

During the past winter and spring over 9,500 miles of state, county or town roads at some time or other were posted as closed to all traffic heavier than passenger cars or light trucks. In 41 upstate counties the arterial mileage so restricted totaled 1,515 miles or 16% of the system. The usual posting has allowed 2 to $2\frac{1}{2}$ tons per axle on state roads, while county and town officials have permitted up to 2 to 6 tons gross or overall load under varying conditions. Postings were lifted under a county-by-county survey of conditions.

Composition of Mixture used by Syracuse District for Winter and Spring Patching

Passing	Retained	Coarse	Intermediate	Fine
—	1"	0-5%	—	—
1"	1 $\frac{1}{2}$ "	35-60%	0-5%	—
1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	20-40%	25-40%	0-5%
1 $\frac{1}{4}$ "	1 $\frac{1}{8}$ "	5-15%	35-50%	55-85%
1 $\frac{1}{8}$ "	No. 80 sieve	5-15%	15-30%	20-35%
No. 80 sieve	—	0-5%	0-8%	0-6%
Hydrated Lime	—	0-1%	0-1%	0-1%
Bituminous Material (including additive)	3.5-4.5%	4.5-5.5%	5.25-5.75%	

With the Manufacturer and Distributors

Appointed District Manager. H. J. Schulte has been appointed district manager for the Reilly Tar and Chemical Corp. He will operate from the new Cleveland sales office, 20106 Kinsman Road, Shaker Heights, O. The new office will handle sales in eastern Michigan, Ohio, western Pennsylvania and Buffalo area of New York.

New Eagle Iron Distributor. Coast Equipment Co., 948 Bryant St., San Francisco, Calif. has been appointed exclusive sales and service representative for the Eagle Iron Works, Des Moines, Ia.

FWD Promotes Walch. Bruce V. Walch, formerly manager FWD Parts Sales Department, has been appointed manager of the Field Service Department of The Four Wheel Drive Auto Co., Clintonville, Wis.

Hinz Joins Wayne Division. A. C. Hinz has been added to the administrative sales staff of the Wayne Division of Gar Wood Industries, Inc., Wayne, Mich. He will have charge of the winch and crane section of the division.

Diachuk Joins Gumont. Richard Diachuk has been appointed a field service representative of the Gumont Division, Pennsylvania Refining Co., Cleveland, O.



OVERMAN'S STONE AND BITUMINOUS SPREADER

MUNICIPAL HIGHWAY DEPARTMENTS say—

"With it we get better and longer lasting roads."

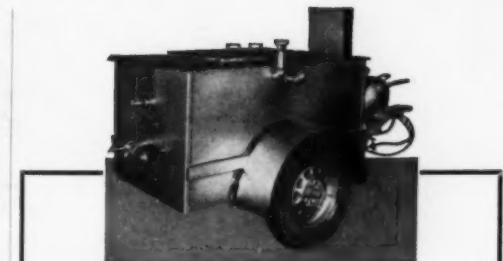
CONTRACTORS say—

"Its fast operation means more jobs and more profit. Can't afford not to own one."

WRITE FOR BULLETIN

I.J. OVERMAN MFG. CO.
BOX 203 MARION, IND.

When writing advertisers please mention ROADS AND STREETS, July, 1951



White Oil Jacketed Kettles for Heating Elastic Joint Filler

Joint filling compounds containing rubber, for elasticity, must have indirect heat application. They melt at 375° and must not exceed 425°. White Model F-10 kettles maintain this temperature accurately by an oil jacket which transfers heat to the compound.

White kerosene burners are safe and dependable, easily controlled. Hand operated agitator. Insulated housing.

Other models for pavement maintenance have FIRE-PROOF tops. Hand or engine sprayers. Made in several sizes.

Write for Catalog

Elkhart White Mfg. Co. Indiana

CUT ESTIMATING TIME with ROLATAPE

The NEW, QUICK Way to Measure Distances

- Measures as it rolls
- Easy to use
- Accurately calibrated

ROLATAPE accurately measures and records as you wheel it over distances to be measured. Model 200 illustrated records up to 100 feet, repeats cycle after ringing bell. Clearly audible click every two feet permits running count. Measures wall to wall, vertical, overhead and curved surfaces easily and accurately. Rugged steel construction withstands hard field usage. Easy to carry, weighs only 2 $\frac{1}{2}$ lbs.

ROLATAPE pays for itself in a short time. Speeds up all kinds of estimating and layout work. No extra man needed to help with measurements. Order today to assure prompt delivery. Satisfaction guaranteed. **ROLATAPE, INC., 1415 14th St., Santa Monica, Calif.**



ROLATAPE handles extremely well, yet folds compactly. Wheel is 7 $\frac{1}{2}$ inches in diameter. Other models available for longer distances, rough terrain.



Only \$17.50

Fill out this coupon and mail today!

ROLATAPE, INC., Dept. A, 1415 14th Street, Santa Monica, Calif.
Gentlemen: Please send _____ ROLATAPE Model 200, at \$17.50 each.

Enclosed is () check () money order for _____

Money will be refunded if returned within 10 days.

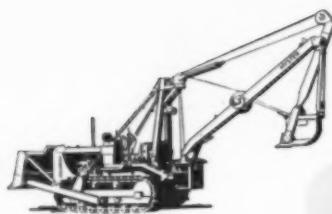
Name _____

Company _____

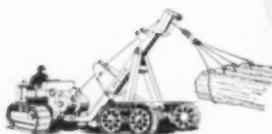
Address _____

City _____

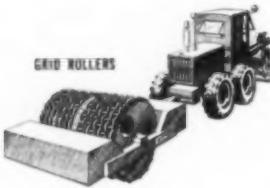
State _____



HYSTAWAY
EXCAVATOR - CRANES



LOGGING ARCHES
AND SULKIES



GRID ROLLERS



TRACTOR WINCHES



FOR 22 YEARS Hyster has been manufacturing TOWING WINCHES and some 30 OTHER TRACTOR TOOLS for Caterpillar-built tractors.

FOR 22 YEARS Caterpillar dealers ALL OVER THE WORLD — more than 400 — have been selling Hyster tractor tools.

NOW well over 40,000 satisfied owners USE Hyster TRACTOR TOOLS.

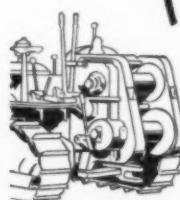
Any Caterpillar dealer can tell you about Hyster equipment.



**WORLD'S LARGEST
MANUFACTURER OF
TRACTOR WINCHES**

HYSTER COMPANY

2995 N.E. CLACKAMAS STREET, PORTLAND 8, OREGON
1895 NORTH ADAMS STREET, PEORIA 1, ILLINOIS



YARDERS AND DONKEYS

REDUCING THE HAZARDS OF

Electrical Blasting

Summarizing the findings of recent research on this subject by the corps of engineers at Fort Belvoir

RESEARCH aimed at reducing the hazards associated with electrical blasting equipment was recently completed by the Engineer Research and Development Laboratories at Fort Belvoir, Virginia, under contract with the University of Maryland. Several explosives companies also aided greatly in this work. Although much of the research served only to confirm previous determinations, some significant findings did result from investigations of lightning, static electricity and especially radio transmitters and transmission lines.

The chief danger in using electrical blasting equipment is the extraneous electrical energy that may enter electric blasting circuits from the outside and cause premature firings. Although this electricity can come from several other sources, those mentioned above present the most serious hazards.

As to lightning, since there is no method of electrical blasting known that can be relied on to offer protection against direct hits, a complete suspension of operations is strongly recommended. Even a near miss can cause a detonation. In fact, lightning strikes to ground a mile away have caused premature firings in deep mines.

Precautions Suggested

Grounding one leg of a blasting circuit at one end or at both ends offers no protection. However, experiments showed that cap shells grounded to one leg wire offer some protection by preventing sparks from jumping between leg wires and shell through the sensitive mixture. If it is necessary to fire during a storm, holes should be fired with a detonating fuse that contains no metallic braid or conducting components. As few holes as necessary should be fired. Series firing with avoidance of loops in the lead wire will also contribute to safety.

The next hazard investigated was static electricity. Mechanically generated by escaping steam, moving belts, revolving automobile tires, etc., and ordinarily considered harmless, static

electricity can be a ruthless killer when found near electrical blasting equipment. For instance, uncoiling the leg wire by throwing it out through charged air will sometimes detonate the cap. The best precaution is to straighten out the long length cap wire along the ground. The use of spool wound caps is a good solution.

In the case of mechanically developed static: (1) all moving equipment should be connected with ground by a circuit having a resistance of not more than one ohm, (2) the connections should be taped or otherwise insulated, (3) wiring should be kept away from rails, other wiring and piping which may be conveying electrostatic charges, (4) the shunts on the cap leg wires should not be removed until explosive charges have been placed and the firing circuits are ready to be hooked up.

One of the most serious hazards to electrical blasting is location near a radio transmitter. However, at present, because it is such a complex function it is practically impossible to devise a means to operate a blasting

circuit close to a transmitter that will absolutely guarantee safety. The only safety seems to be to operate at a "safe" distance, or, if this is impossible, to terminate transmission activity until the blasting is over.

Checking Danger Spots

There is one method of checking danger spots which, though not fool proof, is fairly effective. It consists in setting up a dummy circuit and connecting into it at points where caps are to be located a small one-cell flash-light bulb drawing low current such as a #47 pilot lamp. If such a lamp glows in a circuit, the placement of a cap at that point may be considered potentially dangerous.

Another serious hazard is the location of blasting operations near transmission lines. Measurements were made of the induced currents and voltage in wires placed at or somewhat above ground level under 110,000-volt transmission lines. These included measurements of the induced effects from both the electromagnetic field and the dielectric field.

For results in the electromagnetic field, most of the measurements were made under two 110,000-volt, 3-phase transmission lines which were carrying balanced currents of the order of

★ Control of extraneous electric energy is a chief safety precaution with blasting by electrical methods. (Photo supplied by the Le Roi Company, Courtesy St. Louis Globe-Democrat)



200 to 220 amperes. At the test location, a 220,000-volt, 3-phase transmission line ran adjacent to the 110,000-volt lines. Two test wires were placed parallel to the transmission lines in different positions. They were connected solidly at one end and through either an ammeter or voltmeter at the other end to complete the circuit. The induced current and voltage were measured for each position of the test loop. The tests indicated that both the induced currents and voltages will decrease as the area enclosed by the test loop decreases.

To obtain results in the dielectric field, a test wire was supported 5½ ft. above the ground and parallel to the transmission lines for a length of 240 ft. A voltage of about 2000 volts to ground was measured on the test wire by connecting an electrostatic voltmeter between the test wire and ground. When the test wire was grounded through a microammeter, currents of the order of 500 microamperes flowed to the ground. When the insulated test wire was lowered to the ground, no voltage between the test wire and ground could be detected by the electrostatic voltmeter and the current to ground with the test wire grounded was very greatly reduced.

These test results indicate that induced effects from the dielectric field under a transmission line are very small for wires on the ground as compared to wires raised a short distance above the ground. The tests were made during normal system operation. It is possible that transient conditions existing during system troubles or lightning storms may cause induced effects considerably in excess of those measured. Different results may also be expected for lines operating at voltages or currents, lines with unbalanced currents or lines of different configuration.

Texas Safety Program

(Continued from page 40)

Safety Association, Incorporated, which is the coordinating agency for the Governor's Highway Traffic Safety Program. Teamwork here, like teamwork within its own organization, reaps rich rewards.

SUMMARY. Perhaps the most significant points to be noted from the foregoing description of the Texas Highway Department's Traffic Safety Program is the fact that the application of sound, proved engineering principles still pay dividends; that decentralized operation with proper coordination, planning, and teamwork runs efficiently; that any worthwhile

accomplishment belongs to the whole Department and not to any one unit or individual of the Department; and that teamwork with other agencies concerned is just as essential as teamwork within one organization.

•

"Highway Planning." Bulletin No. 31 of the Highway Research Board bearing this title has been issued. Copies are available for 60c each. It contains papers by I. S. Shattuck and K. D. Rykken, comprehensively treating this important subject. Address request to the Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C.

The Angle Prism

(Continued from page 49)

boundary lines are surveyed by offsets from the traverse line, the length of the individual boundary lines should be measured as a control. The courses can be computed by simple trigonometric formulas.

Another valuable application of the right angle prism is the staking of curves by right angle offsets. In Fig. 8 the staking of a curve by tangent offsets is shown. Equal distances along the tangent are measured and for each tangent point the offset distance is computed.

If it is desired to maintain the stationing along the curve, the tangent distances A and the offsets B for each curve point P are computed as shown in Fig. 9.

Another method of laying out circular curves is to establish the curve points by offsets from a chord as shown in Fig. 10.

The right angle prism is particularly for trigonometric distance measurement as shown in Fig. 11, 12 and 13. The sub-base *b* must be accurately taped and the subtended angle *a* observed with great care. The right angle at the sub-base can be staked out accurately with a right angle prism and a theodolite, a one second reading micrometer theodolite is particularly suited for this type of work. The sub-base length *b* will have to be only about 1/10 to 1/20 of the length of the traverse distance *d*. The distance *d* is calculated from the formula:

$$d = b \cot a$$

No slope corrections are necessary.

The illustrated applications for the use of the right angle prisms are only a few and many other field problems can be solved with this handy little instrument at a great saving in cost.

Soil-Cement Speedily Built In N. Carolina

That soil-cement roads can be built speedily was demonstrated by W. H. Scott, contractor from Franklin, Va., on a 20-mile project in Forsyth County, N.C. This 18½-ft. width paving consisted of 8 sections and was built in June and July, 1950.

Two outstanding day's production records were 6780 and 5700 lin. ft. of paving. All work was completed during daylight hours. Average work-day production was between 4000 and 5000 lin. ft. Soils varied from sandy clay loam to clay loam requiring 10 to 12 per cent cement by volume. Cement haul was 2½ to 3 miles and water haul averaged 1 mile on one project and 2½ miles on the second project.

Equipment and Personnel

To obtain this excellent production record the following list of equipment and personnel was used during full scale operation: 4 dump trucks (cement); 1 bulk-cement spreader; 2 rotary speedmixers (self-propelled); 1 heavy-duty cultivator; 1 two-bottom gang plow; 2 crawler-type tractors; 2 rubber-tire tractors; 5 water trucks (1000-1500 gal. cap.); 1 sheepfoot roller; 1 spike-tooth harrow; 2 motor graders; 1 pneumatic-tire roller.

Personnel: 1 superintendent; 2 foremen; 1 mechanic; 2 mixer operators; 2 motor grader operators; 4 tractor operators; 10 truck drivers; 7 common laborers.

Superintendent for W. H. Scott was H. M. Smith, Assistant Superintendent was Joseph Kirkman.

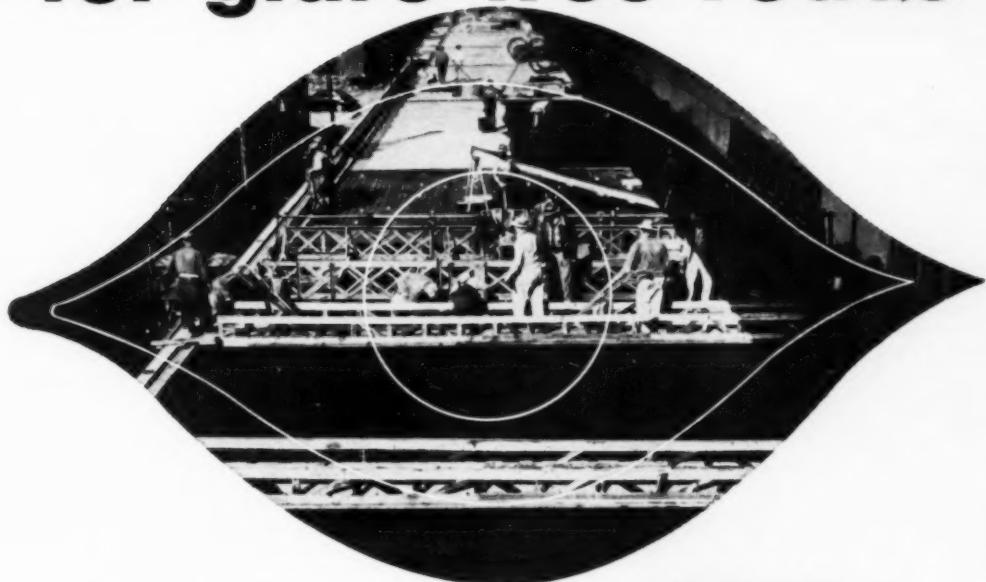
New Building Reference

"Architectural Graphic Standards," probably the best-known and most widely-used reference book for architects, draftsmen, engineers, and builders, has been issued by John Wiley & Sons in a new, much enlarged 4th edition. Almost double the size of the previous edition (614 pages). Architects Charles G. Ramsey and Harold R. Sleeper, authors, have added 368 new plates, while revising 151 plates. The 50-page index including 12,000 cross-indexed entries. Price \$10,000. John Wiley & Sons, 440 Fourth Avenue, New York 16, N. Y.

A recent article in an Ohio newspaper created much favorable comment. It said in part:

"Few Americans realize it, but by far the biggest freight carrier in the nation is the motor truck. Last year, trucks hauled 8.3 billion tons of freight—or three times as much tonnage as was hauled by all the railroads, pipelines, waterways, and airways put together."

for glare-free roads



Reduces the ice buildup on Air Entrained concrete roads because of greater heat absorption by the dark surface.

Surface cracking reduced because the surface is more uniform in temperature.

Permanent road markers are more visible against grey tinted Air Entrained concrete, resulting in greater safety.

HORN AE Dispersed Black

is used in darkening air entrained concrete highways, sidewalks, pavements and center islands.

**Easy to Use—
Used by Government and State
Highway Departments**



• GENTLEMEN: RS 51
• Please send complete data on AE DISPERSED BLACK.
• NAME _____ TITLE _____
• COMPANY _____
• ADDRESS _____
• CITY _____ STATE _____

Water-filled Pneumatic Tires

This idea is being used successfully by Texas highway department—better traction, less tire heat.

By J. F. Snyder
District Engineer, Texas Highway Department

IN the interest of economical equipment operation and savings in wasted labor time, we would like to pass on to you information concerning the use of one hundred per cent water-filled pneumatic tires.

We are all familiar with the use of water in large pneumatic tires to increase traction; also, the use of water to replace most of the air to make the tire run cooler, but the advantages and benefits to be gained by the use of 100% water and complete elimination of air may or may not be realized.

In our attempt to cut down loss of time in our weed mowing operations, we tried puncture proof tubes, reliners, etc., and finally tried using 100% water in place of air. This proved promising, so we had two or three units prepared for further study, which resulted in almost entirely eliminating punctures from thorns and small nails. The use of water-filled tires was then extended to our maintainers, and with remarkable results. We had considerable trouble with "wobble" on the large front wheels now coming with our maintainers, and this "wobble" was completely eliminated when the tires were filled with water.

Having these tires filled by commercial dealers cost \$4 to \$7 per tire, or \$16 to \$30 per unit, which was rather high, but still economical in the long run. In June of last year we requested the Equipment Division to purchase a unit for filling tires with

water, and since then we have filled all pneumatic tires except trucks, pick-ups, and automobiles, and have practically eliminated punctures from thorns and small nails. It appears, judging from the service the first water-filled tires have given us, that the use of water would practically double the life of the tires. Picture 1 shows the condition of recapped tires after two years use.

Data on Results

Most of our mowers are now in the District Shop for general repairs and reconditioning for the coming season, and several tires have been removed for recapping. The two rear tires and tubes inspected by the writer had forty-two small thorn and nail punctures but the tires were standing up when brought to the shop and showed no indication of leaking. When the water was removed and refilled with air, everyone of these punctures leaked and would have been a flat if filled with air.

A flat tire on a mower out on a job will result in not less than four hours lost mowing time, possibly time of a shop employee and equipment rental from the shop. If the mowerman loses four hours at \$1 per hour, that would be \$4. Forty-two flats times \$4 equals \$168 and not counting shop time or equipment rental used in getting this machine back in operation. This is for one season and one machine. Multiply this by the number of mowers in use plus the maintainers and other pneumatic tired equipment, such as small tractors, rollers, and asphalt heaters, subject to such punctures, and some idea of the saving will be realized. Of course, in North Texas anti-freeze would be used during the winter months, which

would add a small expense to the use of water, and in our opinion would still be economical.

The tire filling unit in use in this District is a gasoline-driven Gorman Rupp and cost \$180, so you see that on one mowing unit we practically saved the cost of this machine. Pictures of the unit are shown.

Barber Brothers Break S/C Record In Louisiana

Experience in building soil-cement and good organization can result in a record performance. Barber Brothers Co. of Baton Rouge, La. has made such a record by building 8.1 miles of soil-cement base in 11 working days. The stretch completed was on the Merriville-Bancroft highway in Beauregard Parish.

To achieve this record production, Barber Brothers used the following: 2 No. 12 motor graders; 1 bulk cement charger; 4 cement trucks (10,000-lb. cap.); 1 bulk cement spreader; 4 water trucks (1500-gal. cap.); 1 traveling mixing machine; 1 sheepfoot roller; 1 TD-18 tractor; 1 pneumatic-tire farm tractor; 1 pneumatic-tire roller; 1 spike-tooth harrow.

Highlighting the job was the completion of 14,000 sq.yd. or 1.2 miles of 20-ft. wide pavement in one day. Ten per cent cement by volume of compacted roadway, 6 in. thick, was used. Added to this day's work was 125 sq.yd. of soil-cement in bridge transitions.

Much credit for this feat goes to Barber Brothers' Walter Dickerson and foremen C. N. Swindle and D. King.

Forty-two truck weighing stations are to be constructed by the N.Y. state department of public works, required to implement the state's new Truck Mileage Tax Law, effective October 1.



★ Photo 1. Recapped, water-filled tires look good after two years of trial on mowing machine



★ Tire filling outfit which has paid for itself by betterment of service from one mower

OPERATORS SETTING NEW
Sweeping Records
 WITHOUT LEAVING THEIR SEATS . . .



LULL SHOVELoader

Provides Unexcelled
 Power • Speed
 Flexibility



The most powerful tractor-loader in its class! Fast, smooth hydraulic action. Rips pavements, digs hard materials, scrapes, lifts, lifts, loads, bulldozes, etc. On any job—an outstanding time and money saver!



Largest reach of any industrial wheel-type tractor-loader. Loads from rear to very front of truck body. A full load in every trip without pushing dirt forward in box. Get full details on the versatile Lull Shoveloader, today!



Manufacturing Company

3612 East 44th Street Minneapolis 6, Minn.

Designers and Builders of
 The Largest Line of Allied Equipment
 for Industrial Wheel Type Tractors

SHOVELOADERS • UNIVERSAL LOADERS • FLUID-DRIVEN SWEEPERS • LULLDOZERS • SHOULDER MAINTAINERS

*Fully Automatic**

LULL Fluid-Driven

SUPER SWEEPER

A Time-Saver for:

- Airports
- Streets
- Industrial Plants
- Universities and Colleges
- Parking Lots
- Institutions
- Strip Mining

LULL POWER HYDRAULIC CONTROL RAISES AND LOWERS BROOM . . . or sets at any angle in SECONDS!

The operator of this powerful deluxe Lull Super Sweeper is setting new standards for sweeper performance. He spends all his time sweeping and eliminates wasteful time-consuming manual adjusting operations. He never needs to leave his seat to remove a pin—or turn a crank—or even stop his forward motion to change his sweeping angle. At his finger-tips are all of the controls for broom rotation, speed, height and angle settings, independent of traction motion! He can make any angle selection from 35° left to 35° right in seconds.

LULL POWER HYDRAULIC CONTROL makes this amazing sweeper performance possible. With super speed and super power in the broom, the operator can cover more ground in less time. No backing . . . no deadheading. The Lull Super Sweeper is the ideal 2-way sweeper. Yes, it is so fast, the operator often gets his sweeping done in half the time, making himself available for other work.

Use Lull Super Sweepers for every sweeping job from snow removal in the North to strip mining operations anywhere. A heavy duty sweeper designed for super performance, and priced within the means of all users of power sweeping equipment. Write for literature on 5', 6', 7' models.

MAIL COUPON TODAY for complete details.



LULL Manufacturing Company
 3612 East 44th Street, Minneapolis 6, Minn.

Please send illustrated literature on:

THE LULL SUPER SWEEPER 5' 6' 7'
 THE LULL STANDARD SWEEPER 5' 6' 7'
 THE LULL SHOVELoader

Name..... Title.....

Company.....

Address.....

City..... State.....

NEW EQUIPMENT AND MATERIALS

1 Gasoline Engine Earth Auger

A new lightweight highly maneuverable portable gasoline engine earth auger, announced by Mall Tool Co., is made with new magnesium alloy castings and equipped with 30 in. augers in either 6, 9 or 12 in. diameters. To serve as a dual-purpose machine, this digging unit quickly converts to chain sawing.

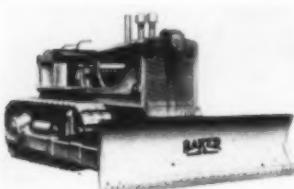


The digging attachment is detached and replaced with chain saw assemblies that are available in cutting capacities from 18 inches to 7 feet. With this one engine and both attachments, post and pole timber can be felled, cut to size and placed in the ground faster and more economically. This unit can also be used to saw large building timbers on the job or clear right-of-way and building sites of trees. Mall Tool Co., Dept. RS, 7725 South Chicago Ave., Chicago 19, Ill.

For additional information circle number of this item on Readers Service Card.

2 Cable-Control Mountings

Redesign of cable-control mountings for the new and larger line of bulldozers, gradebuilders and root rippers developed to match the new and more powerful Allis-Chalmers crawler tractors, has been announced by The Baker Manufacturing Co. Redesign of the cable-control mounting provides maximum visibility, streamlined appearance, easy interchangeability, improved protection for cables



New Cable-Control Mounting

and radiator and new push beam power tilt. The low frame cable mounting provides streamlined appearance with greatest visibility, Baker officials point out. The cable is located under the fender, close to the side of the tractor, well protected from brush and limbs. The built-in radiator guard with perforated grill, is an integral part of the cable frame. Quick, easy interchangeability between 'dozer, gradebuilder and root ripper is provided by removal of a bolt on each side, removal of wedges and detachment of the lower sheave block at the front. The new power tilt eliminates need for jacks or pry bars to raise or lower the push beam. Reverse tilt of the moldboard also is accomplished by power, rather than manual effort. The Baker Manufacturing Co., Dept. RS, 502 Stamford Ave., Springfield, Ill.

For additional information circle number of this item on Readers Service Card.

3 Swing Loader

Fourteen major changes have been incorporated in the new 1952 Model 58L-R1 Mandt swing loader. These changes include: new steering axle and larger wheels and tires, cushion in bucket cylinder to eliminate shock at end of stroke (when dumping), clearance on



1952 Model L-R1 Swing Loader

boom for boom cylinder when boom is in upright position, drag brake on worm shaft of all machines, control valve adjustments and changes in machining of control valve spools, flow controller on crane boom hydraulic line, weight boxes altered to conform to new steering wheels and for clearance for chains on drive wheels, drive axle mounting-block and brace underneath. Mandt Manufacturing Co., Dept. RS, 490 West Goodale St., Columbus 8, O.

For additional information circle number of this item on Readers Service Card.

4 Break-Resistant Blade

A new Clipper break-resistant masonry cutting blade is manufactured in layers of glass fiber cloth impregnated with resins and silicon carbide. This material is then pressed together under



Test of New Clipper "B-R" Blade

hydraulic pressure and processed in kilns where the temperature is scientifically controlled to insure a resilient and tough blade able to take amazing punishment. It is claimed that dropping, twisting in the cut or bending will not damage the blade. The new blade is stated to give outstanding efficiency on small hand-power tools where it is impossible to maintain a true cutting level. Clipper Manufacturing Co., Dept. RS, 2800 Warwick, Kansas City 8, Mo.

For additional information circle number of this item on Readers Service Card.

5 Distributor Spray Bar

A new Littleford development is a full circulating spray bar 24 ft. wide so light that one man can easily lift it. It is a bar end folding type which can be quickly folded for traveling to and from the job. And since its weight is less than half that of steel, it greatly reduces



"Life-Wate" Circulating Spray Bar in Spraying Position

the load at the rear of the Littleford "Spray Master." Mounted on a Littleford distributor, this bar sprays by pressure and circulates materials by vacuum, thus, it is stated, assuring clean, even starts, instant shut-off without drip, and suck-back of any material left in bar after spraying. Lengths of bar may be added quickly by loosening only two bolts. When spraying, all nozzles open instantly and simultaneously, each nozzle can be individually turned off to give any desired width of spray. The new "Spray Master" bituminous distributor has been refined to embody many labor saving features. Littleford Bros., Inc., 454 E. Pearl St., Cincinnati 2, O.

For additional information circle number of this item on Readers Service Card.

6 Balanced Vault Cover

A new safety counterbalanced vault or manhole cover, announced by E. E. Wachs Co., is designed for safe and easy operation. Opening is accomplished by inserting a combination key-handle and giving it a half turn. Lifting the cover to its



The new, 1951 edition of "Soil Stabilization Methods" is off the press. Completely revised and enlarged, 100 pages of pictures, diagrams and practical construction information. It's

FREE. Just ask for Bulletin 25. Write today.



The SEAMAN Self - Propelled (left) is a complete mixing unit which offers full 360 degree operator visibility and accurate control of the mix. It also frees a critical tractor for other work . . .

The SEAMAN TRAV-L-PLANT (right) offers all the advantages of the Self-Propelled unit. It is equipped with tachometer assembly and a volumetric meter is available for the closely controlled application of bitumen. Water also is readily applied.

SEAMAN MOTORS, INC.

291 N. 25th St.
MILWAUKEE 3, WIS.



New Wachs Safety Counterbalanced Cover

vertical open position is a one-handed job because counterweights, which also hold the cover in a protective upright position, ease the load. Other features of the cover are: one man can safely raise cover with ease, cover can not slam or drop into vault to cause injury or damage, cover can be opened from inside of the vault by one man, positive tamper proof lock that can not be opened without Key-Handle, counterbalance structure protrudes less than 6" from wall, 30" square opening, heavy duty cast iron frame and ribbed steel cover machined for accurate rattle-proof fit, "Ollite" bronze bushings in linkage, etc. The E. E. Wachs Co., Dept. RS, 1527 N. Dayton St., Chicago 22, Ill.

For additional information circle number of this item on Readers Service Card.

7

Battery Operated Stacker

An ingenious combination fork lift-stacker and hand truck with elevating platform operating from a standard 6-volt automobile battery, is being introduced by Clark-Hopkins Equipment Corp. It is capable of moving, lifting, and stacking loads up to 750 lb. This new unit has a battery activated motor mechanism which operates the hydraulic lift. What little drain is placed on the battery under capacity use is replaced by the built-in charger during off-hours.



Automobile Battery Operated Stacker

The stacker will lift a load of 750 lb. to a loading height of 55 in. in 6 seconds. The stacker has a platform 21 in. long by 18 in. wide as standard. Clark-Hopkins Equipment Corp., Dept. RS, 1124 Spring Garden St., Philadelphia 23, Pa.

For additional information circle number of this item on Readers Service Card.

8

Ripper Attachments for Bulldozers

New type ripper attachments for bulldozers, made by Hensley Equipment Co., make ripping and dozing at the same time possible. The rippers are available in 12 models to fit all standard bulldozers and scrapers. The ripper shanks



Hensley Ripper Attachment

are attached to the bulldozer blades in a matter of minutes. On the back of each shank is an I-bolt, which is fastened to a small bracket which is welded to the back of the blade. The rippers have reversible wear boots, which because of their special alloy content, are extremely resistant to wear and abrasion. The boots are self-sharpening. As soon as one side is worn, the boot may be reversed and used again. The shanks of the rippers have the benefit of the full weight of the dozer blade. They are angled so as to automatically dig into the rock, shale or soil. It is stated the rippers will dig to a depth of 12 in. in one pass if there is not an excessive amount of rock in the surface. When a large amount of rock or shale is encountered, adequate ripping action can usually be obtained in two 6-in. passes. Hensley Equipment Co., Dept. RS, Joaquin Ave., San Leandro, Calif.

For additional information circle number of this item on Readers Service Card.

9

Trencher Has Forced Ejection Bucket

Several outstanding improvements in the 1951 model of the Oliver-Ware hydro-trencher have been announced by the Oliver Corporation. According to the manufacturer, the outstanding feature of the new model is the "Forced Ejection" bucket, which is available as optional equipment. It can be used with equal ease for both trenching and swing loading. Simply reversing the bucket and dipper stick converts it to a swing loader. The bucket does not have controlled pitch; instead, the control cylinder is used to hydraulically force the bucket gate all the way through the bucket itself, thus "forcing" out all material and assuring complete discharge even where clay, gumbo, or sticky soil is involved. In addition, the 1951 hydro-trencher has an improved counterweight design, is more ruggedly built with a weight increase of approximately 2000 lb. The



Hydro-Trencher with Forced Ejector Bucket

Oliver Corporation, Industrial Division, Dept. RS, 19300 Euclid Ave., Cleveland 17, O.

For additional information circle number of this item on Readers Service Card.

10

2-Wheel Scraper

A new 2-wheel, hydraulically-controlled scraper for use with the John Deere "R" diesel tractor has been announced by American Tractor Equipment Corp. This new scraper, Model H-62, is a 6 yd. scraper and is stated to work at speeds



Model H-62 6 yd. Scraper

up to 12 m.p.h. A special hitch, mounted under the tractor rear axle, eliminates the front wheels of the scraper and transfers a portion of the scraper load to the tractor driving wheels for greater pulling power. It is self-loading and self-spreading; no pusher tractor or extra leveling equipment is required. Like the ATECO conventional 4-wheel scrapers, this new model for use with the John Deere "R" tractor, has a low center of gravity, a high road clearance that permits easy hauling over ditches and levees, an independent front apron, and a rear apron that wipes the scraper bowl sides clean as the load is dumped. American Tractor Equipment Corp., Dept. RS, 9131 San Leandro Blvd., Oakland 3, Calif.

For additional information circle number of this item on Readers Service Card.

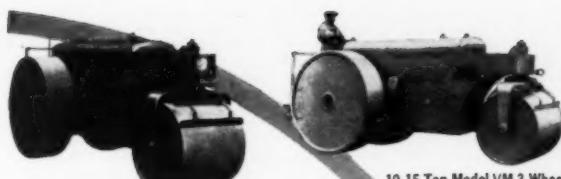
11

Hydraulic Rock Breaker

A hydraulic tool for the demolition of mass concrete or ledge rock where the use of explosives or ball drop is prohibited or impractical, has been placed



Duncan Hydraulic Roc-Jek



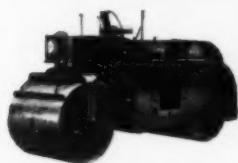
5-10 Ton Model VM 3-Wheel

10-15 Ton Model VM 3-Wheel

IN ROLLERS...IT'S

Buffalo-Springfield

STANDARD
OF COMPARISON
THE WORLD OVER



5-9 Ton Heavy Duty Tandem



8-14 Ton Heavy Duty Tandem



3-5 Ton Portable Tandem



Trench Roller



KX 3-Axle Tandem

There's an authorized
Buffalo-Springfield distributor
conveniently located to serve you



You own the *best* in roller equipment—for less per year than cheaper rollers—when you own Buffalo-Springfield.

That's because Buffalo-Springfields are built to *last longer*—cost less to operate and maintain. They're extra rugged, sturdy, dependable. Made in a variety of types and weights to meet every compaction need, by the world's largest exclusive manufacturer of road rollers.

Buffalo-Springfield service excels also. Buffalo-Springfield distributors in all 48 states and Canada feature modern facilities and complete stocks of genuine factory parts to keep your equipment rolling up profits.

Better see your Buffalo-Springfield distributor before you buy. Or, write the Buffalo-Springfield Roller Co., Springfield, Ohio, for full information.

BUFFALO THE STANDARD OF COMPARISON **SPRINGFIELD**
SPRINGFIELD, OHIO

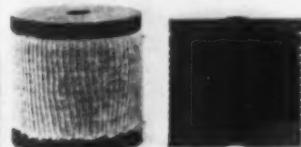
WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF ROAD ROLLERS.

on the market by Duncan Roc-Jak, Los Angeles. The Roc-Jak breaker body is 24 in. long and 3 in. in diameter. It is constructed of the toughest and finest steel. Each breaker is heat-treated and piston openings precision ground. The ten, hardener 1 1/4 in. alloy steel pistons are fitted with neoprene cups tested to withstand 15,000 p.s.i. Each unit is equipped with an equalizing shim, hydraulic pump, hose, drill rod and six 3 1/2 in. drill bits. The weight of the Roc-Jak with hose and pump is approximately 94 lb. Duncan Roc-Jak, Dept. RS, 1350 Wright St., Los Angeles 15, Calif.

For additional information circle number of this item on Readers Service Card.

12 Cellulose Oil Filter

A new oil filter, developed by The Briggs Filtration Co., uses molded cellulose fibers as the medium. A bonding agent is applied to natural cellulose materials which are formed, under pressure, into "cartridges" of blocks. The size of



New Briggs Oil Filter

the fibers controls the porosity of the block. The blocks are then stabilized by a series of thermal processes which fix the finished dimensions. The blocks are rendered impervious to water and therefore retain their original dimensions in use. Laboratory and field tests on the blocks have been in progress for several years, and are reported to show that the new medium has a higher dirt retention capacity than any known materials, and that there is no "unloading" action between filtration cycles. Briggs Filtration Co., Dept. RS, Washington 16, D. C.

For additional information circle number of this item on Readers Service Card.

13 Tractor-Loader Digs at Either End

A hydraulic tractor-loader, announced by the Oliver Corporation, has the ability to dig at either the front or rear end of the tractor, and to dump always in front, leaving the operator free to select the digging end to fit the job. He can load without turning the tractor. Advantages claimed include the following: High mobility of wheel tractor; the increased speed and reduced tractor



"Strait Line" Hydraulic Loader

wear; increased traction possible with rear end digging; easy steerability that reduces operator fatigue. This "Strait Line" hydraulic loader is manufactured by Maine Steel, Inc., South Windham, Maine, for use exclusively on the Oliver Model "77" industrial wheel tractors and is available only through Oliver Industrial Dealers. The Oliver Corporation, Industrial Division, Dept. RS, 19300 Euclid Ave., Cleveland 17, O.

For additional information circle number of this item on Readers Service Card.

14 Masonry Drill Bit

A new carbide tipped masonry drill bit now in production by New England Carbide Tool Co., has a removable center which does away with the necessity of using a wood template to start holes. When inserted, it accurately locates and



Cyclo-Core Masonry Drill Bit

starts a hole. As soon as hole is spotted the center is removed. This accessory also is stated to do away with walking of the bit or marring of the surface being drilled. Dust is expelled by the bit as it drills because of the machined-in spiral threads running the full length of the body. These threads make automatic runways for removing dust from the hole as it is cut. Each bit has a port opening for cleaning out the core. New England Carbide Tool Co., Dept. RS, Cambridge 39, Mass.

For additional information circle number of this item on Readers Service Card.

15 Fire Fighting Unit

A new pallet model Porto pumper fire extinguishing unit mounted on a truck converts it into fire fighting apparatus. Porto pumper's basic equipment is com-



Pallet Model Porto Pumper Fire Extinguishing Unit

posed of a water tank with capacity in excess of 200 gal., hose rack (capacity 600 feet of 1 1/2 in. discharge hose), a demountable Porto pump (which is a rotary positive displacement type rubber gear pump powered by a 4-cycle gasoline

engine), supply hose, aluminum extension ladder, 200 feet fire hose, fire axe and hand extinguisher, straight stream nozzle, combination fog and straight stream nozzle. The slip-on unit pallet model Porto pumper can be easily and quickly removed from the trucking equipment at any time, releasing this equipment for other uses. Porto Pump, Inc., Dept. RS, 227 Iron St., Detroit 7, Mich.

For additional information circle number of this item on Readers Service Card.

16 Troughed Belt Conveyor

A new Fairfield heavy-duty material handling conveyor is stated to be especially designed for construction field operations. This latest Fairfield has a



Model 638 Power Moved Troughed Belt Conveyor

new simplified drive and controls—improved maneuverability of individual wheel steering—hydraulically operated boom hoist—and self equalizing castors for balance in yard operations. Fairfield Engineering Co., Dept. RS, Marion, O.

For additional information circle number of this item on Readers Service Card.

17 Form Clamp

A new Hex-Lock form clamp, developed by Williams Form Engineering Corporation, has as its principal feature the combining into a single unit an adjustable Hex-Lock floating nut and bracket. This combination of nut and bracket, is freely operative as one unit. The new Hex-Lock clamp permits the turning of metal on metal and reduces the friction considerably by not having to turn the metal on the wood. Williams Form Engineering Corporation, Dept. RS, 1501 Madison Ave., S. E., Grand Rapids 7, Mich.

For additional information circle number of this item on Readers Service Card.

18 Road Maintainer

A new road maintainer introduced by Dearborn Motors, which designed primarily for maintenance of unsurfaced roads and road shoulders is stated to be capable of numerous construction operations. Powered by a Ford tractor,



Dearborn Road Maintainer

the maintainer is stated to provide many features found in heavy motor graders. The 8-ft. blade is operated by a separate hydraulic mechanism powered directly by the Ford engine crankshaft, freeing the Ford tractor hydraulic mechanism to operate accessory equipment. The blade can be operated in three pitch positions and nine angle positions and can be lifted 9 1/2 in. above the ground, all through positive hand levers or hydraulic controls. Maximum blade pressure is 3,500 pounds with the blade at a 90 degree angle to the frame. The entire maintainer attachment can be removed from the tractor in approximately three hours and the Dearborn side mounted mower installed on the tractor for highway mowing. Where advisable, the mower can be installed without removing the Maintainer attachment. Dearborn Motors Corporation, Dept. RS, Birmingham, Mich.

For additional information circle number of this item on Readers Service Card.

19

Men Working Sign

A new type "A" safety standard to warn motorists approaching work areas, introduced by Eastern Metal is a specially designed (patent pending) sign which won't blow over. It weighs only 13 lb. and folds together locking the warning sign in place. Size is 27 in. high by 18



Type "A" Safety Standard

in. wide; brilliant baked enamel red frame, yellow sign with black lettered legend. Reflectorized warning signs are also furnished for 24-hour visibility through heavy rains or snowfalls. Eastern Metal of Elmira, Inc., Dept. RS, Elmira Hts., N. Y.

For additional information circle number of this item on Readers Service Card.

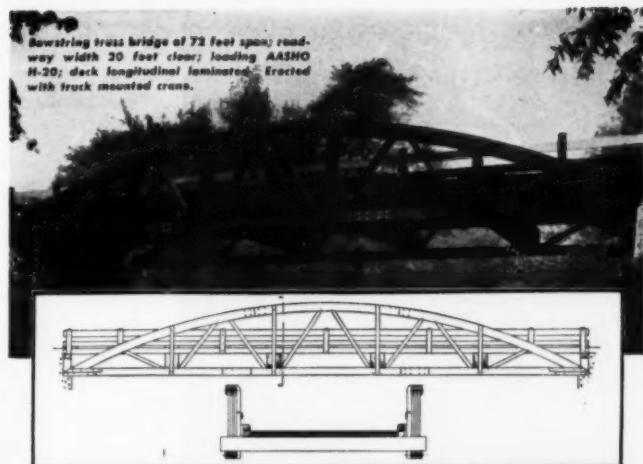
20

Shop Mule Tractor

A new 12,000 lb. drawbar pull tractor with torque converter designed to handle tough pulling and pushing jobs is now



Buda Model HA-120 Shop Mule Tractor



Permanent, Economical Bridges through engineered timber construction

This timber bowstring bridge tells a powerful story of how to get economical adequate bridges that will give long-time service without costly maintenance.

Top and bottom chords are glued laminated timbers composed of kiln dried material permanently "welded" together under pressure by glues which are stronger than the wood itself. These members are dimensionally stable, and will not shrink, twist, check or warp.

All parts of the bridge are precision fabricated, preservatively treated and delivered to the jobsite ready for fast, easy assembly and erection.

Readily available at Timber Structures, Inc. are all types of timber bridges, including arches, bowstring truss, parallel chord truss, girder, and timber-concrete composite deck. Engineering facilities are available, when desired, to supplement those of your staff or to undertake the engineering work involved in the bridge design.

Basic bridge types of Timber Structures, Inc. are illustrated in brochure, "Permanent Timber Bridges". Get your copy from your nearest Timber Structures office, or fill in and mail the coupon.

TIMBER STRUCTURES, INC.

P. O. Box 3782-W, Portland 8, Oregon

Offices in New York, Chicago, Kansas City, Missouri; Dallas, Texas; Seattle and Spokane, Washington

TIMBER STRUCTURES, INC. of CALIFORNIA • Oakland, California

TIMBER STRUCTURES OF CANADA, LTD. • Peterborough, Ontario

Representatives Throughout the United States and Canada

TIMBER STRUCTURES, INC.
P. O. Box 3782-W, Portland 8, Oregon
Please send me your brochure, "Permanent Timber Bridges".

Name _____

Company _____

Address _____

City _____ Zone _____ State _____



LAUSON
ENGINES
RUN cooler!
LAST longer!

Only Lauson has a stream of cool air directed over both valves at the same time . . . greatly reducing engine heat! Another Lauson feature is the cylinder — with extra fins and special head for dissipating heat faster — resulting in cooler operation. These extra engineering refinements . . . and many more add up to true dependability and longer engine-life . . . two factors that make Lauson the best engine buy, anywhere!

...RUN smoother TOO!

Listen to the sweet, velvety purr of a Lauson engine, and you'll know why builders of quality equipment specify Lauson — it's the smoothest power built!

OUTBOARD MOTORS

LAUSON

PORTABLE ENGINES

THE LAUSON COMPANY

New Holstein, Wis., U. S. A. Div. of Hart-Carter Co.
In Canada: Hart-Emerson Co. Ltd., Winnipeg

being manufactured by The Buda Co. The tractor is powered with a 6 cylinder, 230 cu. in. displacement Buda model 6-B-230 gasoline engine. As optional equipment this tractor is available with a Buda model 6-BD-230 diesel engine of the same large displacement and interchangeable mounting dimensions. The Buda Co., Dept. RS, Harvey, Ill.

For additional information circle number of this item on Readers Service Card.

21

Material Handling Tractor

Addition of the Model 3600 tractor to its line of material handling equipment has been announced by Kalamazoo Manufacturing Co. The tractor is powered with a 13 h.p. Wisconsin engine through an automotive type clutch and three speed and reverse transmission. It is stated that as many as ten loaded



Model 3600 Tractor

trailers can be pulled with this tractor, and a loading space of 11 sq. ft. on the tractor itself can be utilized for additional loading.

For additional information circle number of this item on Readers Service Card.

22

Tractor-Loader Combination

A new Oliver-Ware tractor-loader combination has been announced by The Oliver Corporation. The new loader is for mounting on the Oliver Model "B" wide gauge crawler tractor. Advantages claimed include: The unit provides maximum operator visibility. There is no possibility of track-frame or loader arm distortion. The hydraulically controlled bucket permits great breakout action, full bucket loads and controlled bucket discharge. Hydraulic accumulator reduces vibration to the minimum . . . saves strain on equipment and operator. Pumps are engine-crankshaft driven for continuous, uninterrupted operation. Built-in bucket equalizer is standard equipment. The Oliver Corporation, Industrial Division, Dept. RS, 19300 Euclid Ave., Cleveland 17, O.

For additional information circle number of this item on Readers Service Card.

23

Double-Acting Pile Hammer

A new size and model of double-acting pile hammer, announced by McKiernan-Terry Corporation, Dept. 111, 15 Park Row, New York 38, N. Y., is designed primarily for driving steel sheet piling in close quarters. It is stated to be capable of driving one pile between two adjacent sheets, and to be ideal for driving in sand. It normally operates at 280 blows per minute, with an energy of 3200 foot-pounds per blow, and is suitable for 8-in. to 15-in. steel sheet piling or 6-in. by 12-in. wood sheeting or the equivalent size of round timber piles.

For additional information circle number of this item on Readers Service Card.

24

Mower-Loader Attachment

A new attachment for its standard tractor-loader unit, announced by the Oliver Corporation, is a hydraulic mower which can be installed quickly and easily for a few hours or days of mowing and then just as easily removed. The cutter bar is driven by the hydraulic pump of the loader so no separate power units are required. Mower will cut anything from thick, matted grass to moderate brush. Hydraulic safety mechanism

practically eliminates knife damage. Operator can cut right up to obstruction . . . hydraulically raise the cutter bar . . . go right on mowing. The Oliver Corporation, Industrial Division, Dept. RS, 19300 Euclid Ave., Cleveland 17, O.

For additional information circle number of this item on Readers Service Card.

25

Fog "Gun" for Fighting Fires

A fog "gun" developed by Bete Fog Nozzle, Inc., makes it possible to convert ordinary garden hose into a mobile and effective fire fighting weapon. It is a smaller edition of the fog equipment used by practically all fire departments. With the new gun-type nozzle, a water



Bete Fog "Gun"

pressure of only 30 to 120 lb. will produce an effective fog that will instantly blanket and extinguish small fires. What's more, such fog is effective against practically any kind of fire—oil, textile, electrical, wood, etc. This Bete nozzle has instantaneous trigger action and a positive shut-off. Bete Fog Nozzle, Inc., Dept. RS, 85 Pierce St., Greenfield, Mass.

For additional information circle number of this item on Readers Service Card.

WITH THE MANUFACTURERS & DISTRIBUTORS

Export Company Moves Offices. The National Supply Export Corporation which, for the past 17 years has had its offices at 30 Rockefeller Plaza, New York City, has moved to the 20th and 21st floors of a new building at 600 Fifth Ave., New York City. Also making the move is office of the Export Department of the Engine Division of The National Supply Co. and the New York Office of the Spang-Chalfant Division of National Supply.

Appointed Chief Consulting Engineer. C. M. Maratta has been appointed chief consulting engineer of The Timken Roller Bearing Co., Canton, O. He has been with the company since 1917 and has filled the position of plant maintenance engineer and chief works engineer.

P & H Appointment. John H. Taylor, Jr. will handle P & H excavator sales in the Philadelphia area. He leaves the post of assistant sales manager of the Large

Excavator Division of the Harnischfeger Corporation in Milwaukee for his new post.

Timken Promotions. The Timken Roller Bearing Co., Canton, O., has announced the following promotions: R. A. Schimpf, with the company since 1928, has been appointed chief works engineer; H. J. Urback, with the company since 1933, has been appointed executive engineer; L. A. Holder, with the company since 1928, has been appointed chief mechanical engineer.

Elected President Carver Pump. Gordon L. Chapman, heretofore vice president, has been elected president of Carver Pump Co., Muscatine, Ia. Roy J. Carver, founder of the company, was ele-

vated to chairman of the board. Mr. Chapman joined the company in 1948 as comptroller. In July of that year, he was elected vice-president and a director. He had been the active head of the company much of the time due to the extensive foreign travel of Roy Carver on export matters. A graduate of Illinois in 1935, Mr. Chapman spent several years with Touche, Niven, Bailey & Smart, Public Accountants, and later as an executive in Chicago companies before coming to Carver.

New District Sales Engineers. Chain Belt Co., Milwaukee, Wis., has announced the appointment of five new district sales engineers. Edward D. Williams has been assigned to the Philadelphia District sales office. Truman J. Hammel, will work

A STYLE & SIZE FOR EVERY REQUIREMENT

MOLDBOARD

ALLOY STEEL for strength.
ROLLED SMOOTH for less resistance.
ADJUSTABLE for pitch.
SPRING MOUNTED deflectors.
ADJUSTABLE and oscillating shoes.

HITCH

LEVEL Lift.
TAILORED to truck to distribute weight and stress.
4 OR 6 POINT push using Wausau's exclusive toggle.
CHAFING for side thrust.

WAUSAU SPREADERS

Trailer Type

Positive control of Thickness
Positive control of Width
Positive control of Direction
No hazards to passing vehicles
Low Cost self contained unit
A differential drives the hopper agitator and spinner disc which prevents skidding and consequent loss of spreading power while turning corners.
Attaches or disconnects in a minute
Model A Operator platform
"Safety Built"
Long life construction --
Sturdily built
Spreads Materials from 8 to 20 Feet

WAUSAU IRON WORKS
PIONEER SNOW PLOW BUILDERS
WAUSAU, WISCONSIN

Sold and Serviced By Leading Equipment Distributors

WAUSAU

out of the Kansas City office. R. W. DeMott Jr. has been assigned to Chain Belt's New York district sales office. Kenneth Burch, will work out of the Cleveland District sales office. George Robichaud has been assigned to the Boston District sales office.

Heads New Rochester Branch. L. M. Evans, has been put in charge of the new Rochester, N.Y. branch office of Worthington Pump and Machinery Corporation, Harrison, N.J.

Named Heil Chief Engineer. George W. Monk, chief engineer of the Tractor Equipment Division of Bucyrus-Erie Co. for the last 13 years, has been appointed chief engineer of The Heil Co., Mil-

waukee, Wis. He will serve in the newly erected post as an assistant to Arnold F. Meyer, vice president in charge of engineering and aid in the development of a broader road machinery program.

Ernest E. Louis Retires. Ernest E. Louis, assistant to Harry M. Francis, sales vice president, American Steel and Wire Co., has retired after 39 years continuous service with this U.S. Steel subsidiary.

New Huber Distributor. Equipment Inc., Highway 80, Jackson, Miss., has been appointed distributor of the road maintenance equipment of Huber Manufacturing Co., Marion, O. in the southern half of Mississippi.

Heads P & H District Office. James C. Ray has been appointed district manager of the P & H Jacksonville office. He joined P & H in 1940 and has served in the Jacksonville area as an excavator salesman.

Named FWD Service Manager. Charles Glocke, for the past 6 years field service manager, has been appointed manager of the service division of the Four Wheel Drive Auto Co., Clintonville, Wis.

MANUFACTURERS' LITERATURE

26

Pipe Laying Equipment

A new 12-page booklet, titled "International Power Lowers the Boom on Pipelaying Costs," has been published by the International Harvester Co. The part International crawlers play in handling every phase of the pipelaying business is presented in picture-caption style. In addition, the two-color booklet contains a Selectograph showing the lifting capacity of each International tractor when working with a matching Superior pipeboom. International Harvester Co., Dept. RS, 180 North Michigan Ave., Chicago 1, Ill.

27

Hose Fittings and Line Oilers

A bulletin and a specification sheet—the first in a series to supersede the Blue Brute accessories catalog—have been announced by Worthington Pump and Machinery Corporation. The first, Bulletin H-1200-B44, on Blue Brute Hose fittings, includes sizes, parts numbers and applications. The fittings include hose nipple, union nut, hose clamp, coupling spud, reducing coupling spud, spud, reducing spud, threaded pipe nipple, hose valve and splicing nipple. The second, Specification Sheet H-1200-B45, pictures and describes the Blue Brute 2 Qt. line oiler, giving detailed specifications. Worthington Pump and Machinery Corporation, Dept. RS, Dunellen, N.J.

28

Hydraulic Puller

New 8-page bulletin on the new OTC Power-Twin hydraulic puller (capacity 17½ tons—weight 10 lb.) describes how the Power-Twin with its "Center Hole" feature adapts itself to all OTC pulling systems now in use. Illustrates time-saving methods for installing and removing cylinder sleeves, shafts, gears, wheels and many other usages. Also shows conversion sets, new bench presses and Hydratote, portable storage for all parts plus a sturdy press. Owatonna Tool Co., 435 North Cedar St., Owatonna, Minn.

29

Truck Tire Conservation

Containing easy-to-understand information on the subject of tire conservation, a new 8-page booklet "9 Ways to get More Miles Out of Truck Tires" has been published by The B. F. Goodrich Co. The nine methods to have tires provide their maximum service are: Proper selection of tire for the job; correct in-



A special 22 cubic yard capacity Marion Body with Telescopic Hoists—installed on a tandem semi-trailer.

Hydraulic Hoists

Hydraulic Hoists—Through sound engineering and skillful use of high quality materials, Marion has produced a variety of standard and special hoists for efficient dumping service. Marion's extra attention to detail pays off "on the job" in dependable, economical . . . more profitable operation.

Dump Bodies

Dump Bodies—Marion bodies are designed with built-in endurance to withstand the hard knocks of heavy haulage duty. Marion's stronger, all-welded construction means longer body life, less maintenance cost . . . real over the years dependability.

Your near-by Marion distributor can furnish genuine Marion parts and factory "know-how" for your service and repair needs. It pays to deal with an authorized Marion distributor.

MARION MARION METAL PRODUCTS CO.
BODIES AND HOISTS
MARION, OHIO, U. S. A.

Standard and Special Hoists and Dump Bodies for Light, Medium, and Heavy-Duty Service

flation; correct loading and load distribution; correction of mechanical defects; proper care of tubes; regular rotation of tires; proper matching and spacing of duals; savings through recapping and repairing; and proper driving habits. Text of each of the subjects is short, informative and illustrated. A truck tire load and inflation table and a dual spacing table are among the features. B. F. Goodrich Co., Dept. RS, Akron, O.

30

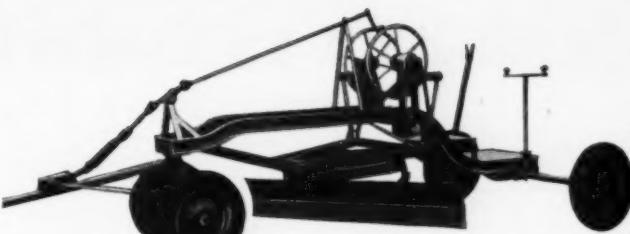
Steel Drafting Tables

One page illustrated bulletin catalog sheet gives complete information on and describes many advantages of the new Stacor steel drafting tables. The Stacor 4-post drafting table is available with one shallow and one tool drawer, with tool drawer only, or without drawers. All models, in hard baked grey enamel finish, have all-steel 4-post base all-steel foot rest and 2 all-steel adjusting devices. Also described are finger-tip adjustment drawing tables. Stacor Equipment Corporation, Dept. RS, 1891 Atlantic Ave., Brooklyn 33, N. Y.

31

Power Transmission Drive

A complete catalog is now available on the revolutionary, new HY-VO power transmission drives recently announced by Morse Chain Co. The catalog, No. C 72-51, includes: A basic discussion of the operating principles behind chain drives; highlights of the new design principles incorporated in HY-VO Drives; description of what the drive will do in the field of high-speed, heavy-duty power trans-



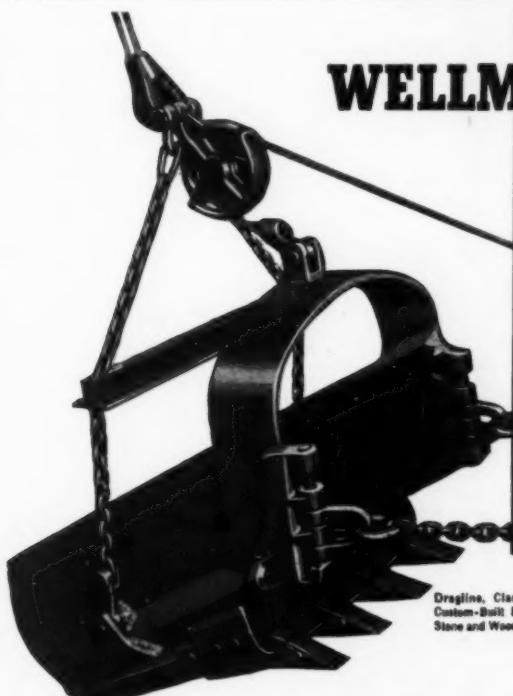
(Above)—Model 7-A, a small grader but a big performer with many good features. Also, The Model 80, heavier, better for high banks with its longer reach.



(Left) — A compactly designed, strongly built, reasonably priced earth mover that can be used with any tractor. Made in 1 yd. and 2 yd. sizes. Hydraulic controls.

Send for complete
specifications folder
No. 551-A

THE GLEDHILL ROAD MACHINERY CO.
GALION, OHIO



WELLMAN Williams Type

MORE YARDAGE PER DAY

- Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts? Write for free
descriptive bulletins

Dragline, Clamshell,
Custom-Built Buckets
Stone and Wood Grabs

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

Quick Help on Product Information

1. For latest information on any product you need in roadbuilding, earth moving heavy construction, etc., use business-reply card inserted in this publication. Just fill in our code numbers on blank lines of Part "C" of the postcard, fill in name, address, etc., tear out, and mail.
2. For information on particular products advertised in this issue, use Part "A" of the bound-in cards.
3. Part "B" of the cards is also usable for further information on any items described in the "New Equipment and Materials" or "Manufacturers Literature" sections of the magazine.

(List continued on opposite page)

QUICK HELP FOR YOU TODAY!

Let Roads and Streets help you efficiently, economically, quickly.

Save your time, your secretary's time, stationery and postage by letting us handle your information needs.

FIRST, fill in your name, title, company or government department, street address, city and state at the top of the card.

THEN—

If you want information about any of the products advertised in this issue of Roads and Streets, enter the advertisements' page numbers and advertiser's names in section A of the card.

B If you want more facts about any of the new equipment or the trade literature described in this issue, circle the proper numbers in section B of the card.

C If you want catalogs for any of the products listed on the two pages next to this card, enter the proper product names or numbers in section C of the card.

IT'S as simple as ABC—fast, dependable, and without obligation on your part.

Readers' Service Dept.

ROADS AND STREETS
22 West Maple Street
Chicago 10, Illinois

My Name _____ My Title _____

My Firm or Govt. Dept. _____

St. Add. _____ City. _____ State. _____

**ENTER
ORDER
and
bill me
for
1 yr. to
ROADS &
STREETS
at \$5.00**

Check Here

7-51-63

Information about the products advertised on:

Page. _____	by. _____	Page. _____	by. _____
A Page. _____	by. _____	Page. _____	by. _____
Page. _____	by. _____	Page. _____	by. _____

More new equipment information or trade literature on items circled:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
B 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Catalogs describing the following products listed on opposite and following right-hand pages:

My Name _____ My Title _____

My Firm or Govt. Dept. _____

St. Add. _____ City. _____ State. _____

**ENTER
ORDER
and
bill me
for
1 yr. to
ROADS &
STREETS
at \$5.00**

Check Here

7-51-63

Information about the products advertised on:

Page. _____	by. _____	Page. _____	by. _____
A Page. _____	by. _____	Page. _____	by. _____
Page. _____	by. _____	Page. _____	by. _____

More new equipment information or trade literature on items circled:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
B 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Catalogs describing the following products listed on opposite and following right-hand pages:

My Name _____ My Title _____

My Firm or Govt. Dept. _____

St. Add. _____ City. _____ State. _____

**ENTER
ORDER
and
bill me
for
1 yr. to
ROADS &
STREETS
at \$5.00**

Check Here

7-51-63

Information about the products advertised on:

Page. _____	by. _____	Page. _____	by. _____
A Page. _____	by. _____	Page. _____	by. _____
Page. _____	by. _____	Page. _____	by. _____

More new equipment information or trade literature on items circled:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
B 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Catalogs describing the following products listed on opposite and following right-hand pages:

A NEW LEAF FOR YOU TO TURN OVER!

Right Now!

Postage
Will be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

BUSINESS REPLY CARD

First Class Permit No. 82, Sec. 810, P. L. & R., Chicago, Ill.

ROADS AND STREETS

22 WEST MAPLE STREET

CHICAGO 10, ILLINOIS

Postage
Will be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

BUSINESS REPLY CARD

First Class Permit No. 82, Sec. 810, P. L. & R., Chicago, Ill.

ROADS AND STREETS

22 WEST MAPLE STREET

CHICAGO 10, ILLINOIS

Postage
Will be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

BUSINESS REPLY CARD

First Class Permit No. 82, Sec. 810, P. L. & R., Chicago, Ill.

ROADS AND STREETS

22 WEST MAPLE STREET

CHICAGO 10, ILLINOIS

On the reverse side of this sheet is an opportunity for you to get quickly, efficiently and economically all the information you may need about:

A Products advertised in this issue of Roads and Streets.

B New equipment described in it or new trade literature mentioned, or

C Any other products—machinery, equipment, materials or supplies—that may interest you. A suggestive list—specially compiled and arranged for your convenience—appears on the two pages adjacent to this card. Consult it.

The Readers' Service Department of Roads and Streets is ready to help you now or at any other time, and as frequently as your needs may require. Do not hesitate to make full use of it; you will not be obligated in any way.

So, turn this leaf now and let us start helping you today.

Readers' Service Dept.
ROADS AND STREETS
22 West Maple Street
Chicago 10, Illinois

Quick Help on Product Information

1604	Plants Bituminous (Portable)	R	2411	Skullcrackers	3410	Tools, Mechanics' (Construction and Equip.)	
1601	Plants, Bituminous (Stationary)	3808	Rake Attachments for Graders	5602	Snow Fencing	2822	Towers, Material-Hoisting
1603	Plants, Bitum. Travel	6008	Reels, Hose	5603	Snow Loaders	7613	Track, Industrial-Railway
2809	Plants, Cement (Bulk; Portable)	3014	Reinforcing Bar Accessories	5604	Snow Plows, Blade and V-Type	6208	Tractors, Crawler
2812	Plants, Concrete-Mixing (Portable)	2203	Rippers and Rooters	5606	Snow Plows, Rotary (for Motor Graders)	6209	Tractors, Wheel
2810	Plants, Concrete-Mixing (Stationary)	1014	Riveters and Chippers	5607	Snow Plows, Sidewalk	4609	Traffic Line Marking Machines
2810	Plants, Concrete-Mixing (Stationary)	5206	Pneumatic Rollers, Single Drum	4202	Soil Sampling and Testing Sets	6603	Trailers, Flatbed
1208	Plants, Crushing and Screening (Portable)	1801	Rollers, Grid-Type	5208	Soil-Stabilizing Eqpt.	6604	Trailers, Tilting
1209	Plants, Crushing and Screening (Stationary)	5204	Rollers, Pneumatic-Tired	1820	Spray Bar, Bituminous	6605	Tramways, Aerial
5405	Power Control Units	5203	Rollers, Tandem	1805	Sprayers, Bit, Hand	6802	Trenching Machines
5004	Power Plants, Portable	5205	Rollers, Sheepfoot	2615	Spreaders, Concrete	2616	Truck Mixers
7008	Power Take-Offs, Truck	5207	Rollers, 3-Wheel	1404	Spreaders, Dry Material	7011	Trucks, Motor
6206	Power Units	2010	Rollers, Trench	5805	Sprinklers, Street	7007	Trucks, Industrial (Fork)
3218	Preservatives, Wood	6207	Rubber Road Materials	2412	Steel, Alloy	7012	Trucks, Off-the-Highway
3406	Presses, Crawler Track Pin	5804	Rust Preventives, Engine	3015	Steel, Concrete-Reinforced	7614	Tubing, Steel (Seamless)
4801	Pull Shovels (Backhoes)	2820	Salamanders	7404	Steel, Structural	U	
6403	Pull Shovels, Tractor-Mounted	1804	Sandals, Bitum. Paving	4203	Surveying Instruments	3220	Underpasses, Pedestrain and Livestock
6402	Pull Shovels, Trailing, 2-Wheel	4607	Sand Blasters	5804	Sweepers, Street	V	
1213	Pulverizers, Hammer	3408	Saw Rigs	T		4007	Valves, Hydraulic
5005	Pumps, Bituminous	3407	Saws, Chain	4812	Tagline Controls	1015	Valves, Safety (Air-Line)
5014	Pumps, Centrifugal (Portable)	1402	Scales, Weigh-Batcher	7010	Tail Gates, Elevating	2617	Vibrators, Concrete
5006	Pumps, Centrifugal (Stationary)	1402	Scales, Wheelbarrow	1819	Tanks, Relay and Storage (Bituminous)	W	
5007	Pumps, Diaphragm	2204	Scarfiers	7612	Tarpaulins	5408	Wagons, Dump
5008	Pumps, Displacement	5407	Scrapers, Drawn	2009	Tar, Road	1217	Washers and Scrubbers, Aggregate
5009	Pumps, Dredge	5406	Scrapers, Self-Propelled	2205	Teeth, Bucket, Ripper, Scarifier, etc.	4610	Waterproofing Compounds
5010	Pumps, Gear	2821	Screeds, Concrete	3016	Tie Rods	7203	Welding Apparatus
5011	Pumps, Grease and Oil	2614	Screeds, Vibrating	6011	Shafts, Flexible	7204	Welding Rods
5012	Pumps, Hydraulic	1216	Screens, Vibrating	2410	Sheaves and Pulleys, Wire Rope	3411	Wheelbarrows, Power
5013	Pumps, Jetting	3809	Scythes, Power	6009	Tires, Construction Equipment	2413	Wheels, Steel
5016	Pumps, Pneumatic	7615	Shovels, Crawler-Mounted	6010	Tires, Truck	3810	Wideners, Highway
5015	Pumps, Rotary	7611	Shovels, Tractor-Mounted	3409	Tool Carts	4008	Winches
		4811	Signs, Road	1812	Tools, Hand (Bituminous)	3017	Wire, Form and Tie
			Skimmers	2818	Tools, Hand (Concrete)	3009	Wire Mesh, Pavement
						7405	Wire Rope

mission; HY-VO capacities, speed ranges and service factors for selecting drives; installation and lubrication procedures. Morse Chain Co., Dept. RS, 7601 Central Ave., Detroit 8, Mich.

32

Bucket Loaders

Three models of Haiss bucket loaders are covered in an eight-page bulletin. The models are the 75, 77 and 75-SBC. Illustrations and drawings showing dimensions of the three models are given as well as their general specifications. Pictures show the loaders in action on various jobs. George Haiss Mfg. Co., Inc., Dept. RS, Park Ave., New York 51, N. Y.

33

Darkener for Air Entrained Concrete

Horn AE dispersed black for use in darkening air entrained concrete is covered in a bulletin issued by A. C. Horn Co. Results of tests showing the favorable effect of this new carbon black dispersion on air entrainment, flow, strength, and freezing-thawing resistance of mortar and concrete are included. This AE dispersed black meets all specifications on color and compressive strength, and keeps the air in air entrained concrete. A. C. Horn Co., Inc., Dept. RS, 43-36 Tenth St., Long Island City 1, N. Y.

34

Diesel Electric Sets

A new 16-page booklet issued by Caterpillar Tractor Co. illustrates the wide usage of Caterpillar diesel electric sets on various power applications. It briefly outlines specifications of its models ranging from 21-KW to 314-KW. A special chart for self-regulated and externally-regulated sets is also featured. Additional information offers the reader the type of attachments available, simplicity of construction, portability, long life, performance and reliability of Caterpillar diesel electric sets. Caterpillar Tractor Co., Dept. RS, Peoria 8, Ill.

35

Tractor Equipment

A new catalog, Form No. 1106, covering the complete line of Trackson tractor equipment, is available. Products described and illustrated include the Trackson tractor-shovel teammates of matching "Caterpillar" diesel tractors. All five sizes of Tracksons are shown including the hydraulic Trackson, Model HT4. Other machines illustrated and described include Trackson pipe layers, earth augers, tracloaders, swing cranes and land clearing equipment. Specifications are included for each unit. Trackson Company, Dept. P, Box 728, Milwaukee 1, Wis.

36

Roller Bearings

A new Shafer catalog No. 51 fully illustrates and describes the full line of Shafer products including pillow blocks, flange units, flange cartridge units, cartridge units, duplex units, take-up units, take-up and frame units plus unmounted roller bearings. The catalog contains complete engineering and load rating data and illustrates many product applications. Shafer Bearing Corporation, Dept. RS, 801 Burlington Ave., Downers Grove, Ill.

37

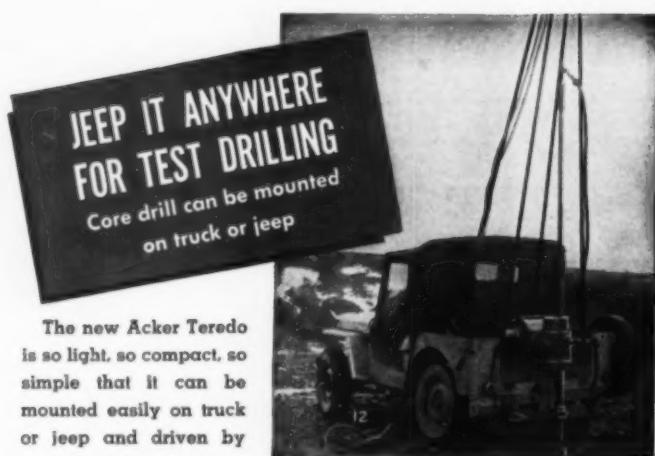
Tension Load Cells

Bulletin 325 on the new Baldwin Type P SR-4 tension load cells has been announced. These cells are based on SR-4 bonded resistance wire strain gages for load measurement. The 2-page bulletin illustrates and gives specifications for load cells of four capacities between 10,000 and 100,000 lb. M. L. Hall, Manager, Testing Equipment Department, Baldwin-Lima-Hamilton Corporation, Dept. RS, Philadelphia 42, Pa.

38

Grid Roller

A catalog featuring design and application of the grid roller for bituminous road salvage has been issued by the



The new Acker Teredo is so light, so compact, so simple that it can be mounted easily on truck or jeep and driven by separate motor or power take-off. Small as it is, the Teredo is a high capacity, fast-operating unit capable of extracting cores up to 2-3/16" in diameter and of drilling to depths of 600 feet.

Send for bulletin 3-A-RS.

ACKER DRILL COMPANY INC.

Scranton 3, Penn.



From stockpile or windrow this speedy, sturdy loader makes fast work of any loose material. Users like the idea that it requires only one man to operate it—that it puts away 3 to 5 yards per minute—that it gets from job to job at truck speeds. You'll like it, too, if you'll let it demonstrate what it can do!

Send for complete specifications—Folder 947-104



JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS

When writing advertisers please mention **ROADS AND STREETS**, July, 1951

Hyster Co. The six-page grid roller literature introduces the newest piece of equipment in the Hyster line and shows practical applications on highway salvage jobs throughout the country. Operation of the grid roller, towed by either a "Caterpillar" motor grader or tractor dependent on grades, is described in a seven-phase, step-by-step style. Details of the drums, grids and weight factors are fully interpreted. Hyster Co., Dept. RS, 2902 N. E. Clackamas St., Portland 8, Ore.

39

Civil Defense Communications

A new General Electric brochure pictorially presents typical communications systems now in use which can be coordinated into a dependable emergency communications network in any community. The brochure also describes the company's technical advisory service for civil defense radio communications. It lists G-E specialists in 22 district offices throughout the country, who are available without charge to analyze existing communications systems and recommend methods of forming them into a single network to operate in any peacetime or wartime emergency. Dept. N-5, G-E Advertising Division, Electronics Park, Syracuse, N. Y.

40

Manual on Hydraulic Control

A handy pocket-sized guide on the operation and care of the "direct acting" hydraulic control of P&H power cranes and shovels has been released by Harnischfeger Corporation. It tells operators how to get the utmost efficiency out of this modern system. The 28-page booklet contains complete information on the hydraulic control system and describes the correct procedure for dismantling, adjusting and replacing parts. Identification of parts is made easy by the use of numerous keyed photographs and cutaway drawings. A 4-page "fold-out" diagrammatic illustration shows the entire hydraulic system. Harnischfeger Corporation, Dept. RS, 4400 W. National Ave., Milwaukee 14, Wis.

41

Metal Lath Fire Resistant Ratings

A new comprehensive summary of metal lath and plaster fire resistive ratings—First Revision—April, 1951 has been prepared by the Metal Lath Manufacturers Association. There are four pages of tables, listing 85 fire-resistance ratings ranging from one hour to four hours. The summary gives the thicknesses required in providing metal lath and plaster fire protection for columns, steel beams, girders and trusses, various floor assemblies (including steel joist, cellular, and wood joist) and steel roof deck assemblies. Metal Lath Manufacturers Association, Dept. RS, Engineers Building, Cleveland 18, O.

42

Corrosion Control Coatings

A complete presentation on the characteristics, properties, uses and methods of application of synthetic rubber resin based coatings is contained in a new brochure issued by the Casey & Case Coating Co. Covered are machinery enamels, damp-wall enamels, stucco-masonry coatings and scuff-free floor finishes, all primarily formulated for maximum resistance to corrosion or

erosion. Casey & Case Coating Co., Dept. RS, P. O. Box 151, Maywood, Calif.

43

Earthmovers

Interesting highlights on "Caterpillar" high speed earthmovers, the new Cat DW20 tractor with its W20 wagon and No. 20 scraper and the Cat DW21 tractor and No. 21 scraper, is presented in a 24-page booklet. The booklet features the new 6-cylinder supercharged DW20 and DW21 diesel engine. It points out the exclusive fuel injection system developed by "Caterpillar" and includes design and performance data on the 225 HP engine. Additional information is presented in specifications of the DW20 and DW21, the No. 208 bulldozer, the No. 27 cable control, the W20 wagon, and No. 20 and No. 21 scrapers. Caterpillar Tractor Co., Dept. RS, Peoria 8, Ill.

44

Pile Hammer for Close Quarters Work

A bulletin describing its new double acting pile hammer, designed primarily for driving steel sheet piling in close quarters, has been issued by McKiernan-Terry Corporation, Dept. 111, 15 Park Row, New York 38, N. Y. The bulletin contains a sectional drawing, complete specifications, dimensions, parts list, and instructions for attaching angle iron guides.

45

Diesel Crawler Tractor

A new International TD-9 diesel crawler tractor catalog has been published by

International Harvester Co. A two-color presentation, the catalog contains detailed specifications and information on how the TD-9 develops and applies its 40.5 drawbar horsepower. Several varied job application scenes appear in the publication along with information on construction and operating features. The catalog may be obtained by requesting form CR-313-A. International Harvester Co., Dept. RS, 180 North Michigan Ave., Chicago 1, Ill.

46

Tar and Asphalt Hose

Tar and asphalt hose is described in a new folder issued by Chicago Metal Hose Corporation. This hose has been manufactured by the corporation for many years and is used extensively for many types of tar and asphalt road surfacing and repairing equipment. Equipment such as paving mixes, tar wagons, heaters and patch and spray equipment. It is also used for unloading tar from tank cars and for handling tar and asphalt at bulk plants. Chicago Metal Hose Corporation, Dept. RS, 1315 South Third Ave., Maywood, Ill.

47

Welding Alloy Specifications Chart

A new edition of their 6-page folder containing specifications on close to 100 different "Low Temperature Welding Alloys" used in welding, brazing, and hard surfacing of steel, alloy steels, stainless, cast iron, brass, bronze, copper, aluminum, magnesium, zinc die cast, etc., is available from Eutectic Welding

Alloys Corporation. Detailed information is given for each alloy and electrode, covering: type and preparation of joints; preheating of parent metal; color match rating with metals for which listed; approximate heat and corrosion ratings, etc. Included also, is a full page listing of "1001 Ways to Save in Your Plant," covering a variety of welding applications and the alloys recommended in each instance. Eutectic Welding Alloys Corporation, Dept. RS, 172nd St. and Northern Blvd., Flushing, N. Y.

48

Protecting Engineering Drawings

A handbook by the Remington Rand Management Controls Division points the way to maximum protection for engineering drawings. Entitled "How Safe Are Your Drawings?" The handbook SC 688 indicates the multiple dangers to drawings under defense or war conditions. The booklet shows the kind of fire-resistant protection drawings must have. Facts illustrating the fallacy of "fireproof" building protection are given in the booklet. Information on maximum protection against fire, use of safe-cabinets for drawings and other types of tested safe-files and map and plan units is also incorporated in the brochure. Remington Rand Inc., Dept. RS, 315 Fourth Ave., New York 10, N. Y.

49

Heavy-Duty Pipe Coupling

An illustrated bulletin describing its heavy-duty wedge-lock coupling for use on temporary or permanent pipe lines is available from Naylor Pipe Co. Speed

MORE YARDAGE PER HOUR PER DOLLAR



Here a 1 cu. yd. Sauerman Scraper digs gravel from high hill and feeds screening plant at rate of 1100 tons a day, at an amazingly low cost.

SAUERMAN SCRAPER

★

Step up the yardage you move each hour—as you lower material handling costs—with a Sauerman Power Drag Scraper. This rugged, versatile machine combines digging, hauling and dumping in a continuous, one-man operation.

Crescent bottomless scoop, an exclusive feature of Sauerman Scraper machine, handles larger loads faster, using less power than similar sized scrapers—digs effectively in any kind of earth or bulk material.

Send today for new catalog

SAUERMAN BROS., INC.

588 So. Clinton St.

Chicago 7, Ill.

Every 100 units *Saves You \$4000*
PER YEAR COMPARED TO COST OF
OPERATING KEROSENE FLARES

**THE NEW AMAZING
Neo-Flasher
WARNING LIGHT**
Operational cost 1½¢ per night

MODEL
1-100 C

Operates approx. 1,000 hrs. on

one 6-volt Neo-Power Pak Battery (50 days and nights).

- No Wiring • No Maintenance • No Filling • No Cleaning • No Fuel • Waterproof • Brilliant Flash visible approx. one mile • Wind will not blow it out
- No Fire Hazard • Clips to prevent theft • Guaranteed for Dependability and Ruggedness.

NEO-FLASHER 1-100 C designed for: Construction Jobs, Municipalities and Utilities, Police and Fire Depts., Airports

MAIL COUPON FOR FREE BROCHURE

LIGHT PRODUCTS, INC. Dept. 7R

407C COMMERCIAL CENTER, BEVERLY HILLS, CALIF.

Name _____

Address _____

City _____ Zone _____ State _____

**VULCAN PAVEMENT AND
CLAY DIGGING TOOLS**

ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

Send for NEW Vulcan illustrated CATALOG today.

**THE WORLDS LEADERS IN
TOOLS — THE WORLD OVER —
NOTED FOR QUALITY AND DURABILITY**

VULCAN TOOL MFG. CO.
QUINCY, MASS.

CUT YOUR SWEEPING COSTS 75%

Wilshire POWER SWEEPER

Picks up everything from cigarette butts to pop bottles in one easy operation!

Write today for dealer nearest you and **FREE on-Your-Job DEMONSTRATION.**

For dealer nearest you, write Dept. D-7

**Wilshire
POWER SWEEPER CO.**

520 W. Chevy Chase Drive

Bethesda 4-Card



and simplicity of connection are features, according to the description, and a hammer is the only tool required to connect or disconnect the coupling. Complete specifications on this one-piece positive type coupling are included in range of light-weight pipe sizes from 8 inches to 30 in. diameter. Naylor Pipe Co., Dept. RS, 1230 East 92nd St., Chicago 19, Ill.

**50
Water Control Gates**

A new folder tells how Armeo gates meet water control needs. Easy operation, long service life, adaptability, and low cost are listed as several of their features which have resulted in the wide use of the gates in irrigation, flood control, drainage, sewage and water supply. Photographs show typical applications of some of the twenty-seven different models of Armeo gates. Armeo Drainage and Metal Products, Inc., Dept. RS, General Offices, Middletown, O.

51

Snow Melting Systems

Four highway snow melting systems are included in a study of 50 such systems in a 36-page bulletin of A. M. Byers Co. The book contains 83 illustrations, mostly showing the systems either operating or being installed, plus eight piping layouts for a variety of installations including loading areas, ramps, sidewalks, driveways, and highways. The text contains chapters devoted to: design, piping properties, use of anti-freeze, paving design and fill, fabrication and installation, installing and operating costs, operating practices controls, and auxiliary units. Engineering Service Department, Dept. RS, A. M. Byers Co., Pittsburgh, Pa.

**BLADES
AND CUTTING EDGES
of Superior Quality by
Shunk**

For all makes and types of road building and road maintaining machines. Also —

**BULLDOZER BLADES
BUCKET LIPS
PATENTED
SCARIFIER and
ICE AND SNOW
REMOVAL BLADES
MOLDBOARDS
SCARIFIER TEETH**

All widths, lengths, and thicknesses; accurately punched to fit your make of machine.

Write for bulletins and other information.

Shunk

**MANUFACTURING
COMPANY**

Established 1854
BUCYRUS, OHIO.

Pursuant to An Order by The Board of Directors We Will Offer at

PUBLIC AUCTION

(A Voluntary Liquidation)

THE EQUIPMENT OF SMITH CONTRACTING CORP. AT THEIR VIRGINIA YARD

\$1,500,000 VALUE, LITTLE USED, RECONDITIONED, MODERN EARTH MOVING & PLATE FABRICATING EQUIPMENT

Subject to Owner's Acceptance or Rejection As Per Rules Posted at Premises

At Manassas, Va., 15 MILES S.W. OF
WASHINGTON, D.C.

Tuesday, Aug. 7,

STARTING
10 A.M. DST.

PARTIAL LIST OF THIS ALMOST NEW EQUIPMENT USED ON ONE OF THE INCH LINES

50 Tractors, TD24's—18's—14's—HD19's—D4's—D6's, etc., equipped with miscellaneous booms, blades, angles, balls, winches, high lifts, etc.; 27 gas driven Lincoln Welders 200 amp.; 18 water pumps, gas driven 2½" to 6"; 3 Buckeye Ditchers 48 & 51; 7 Air Compressors 210 to 500 CFM, Diesel and gas; 12 Dope Pots, Draglines, Hoes, Clams, Speeder Cranes; 23 Pick Up Trucks, mostly 1950 Chevrolets—low mileage; 50 Trucks, including

Henderson Diesel, KER11 & 12, Chev., Dodge, Half Trucks; 8 Trailers, low-boys, etc., Wagon Drills, Jack Hammer, Cutting and Beveling Machines, Alignment Clamps, Auto Release Tongs, Acetylene Cutting & Welding Equipment, Pipe Croddles, Yokes, Sling, Road Boring Machines, Root Rakes, Chain Saw, Dragline Buckets, Clams, Light and Power Units, Small Tools, Supplies, Drill Rods, Spare Parts, etc.

INSPECT AT ONCE—YOU CAN HAVE AN OPERATIVE DEMONSTRATION!

INSPECTION JULY 16th TO DATE OF SALE • WIRE, WRITE OR PHONE FOR INFORMATION

HETZ AUCTION SALES

P. O. BOX 671, WARREN, OHIO.
PHONE AT PROJECT: MANASSAS 490

PH. NILES, OHIO, 2-2509
FT. WORTH PH. FANNIN 6147

When writing advertisers please mention ROADS AND STREETS, July, 1951

FOR SALE

2 Model "D" Roadster Tournapulls equipped with 8 yd. Scrapers, 800 hours	\$32,500.00
1 TL 20 Self Propelled Truck Crane	12,500.00
1 HD 10 Allis Chalmers Angle Dozer	8,500.00
1 TD 14 International Angle Dozer	7,500.00
1 Etnyre Bituminous Distributor Mounted on K-7 International	4,500.00
1 D 6 Cat. Angledozer	8,500.00
3 KR 11 International Dump Trucks, 6 yd. Rock Bodies	9,000.00
1 Worthington Wagon Drill (New)	2,000.00
1 Tampa Sheepfoot Roller (Double Drum)	1,200.00

STANDARD ASPHALT & TAR COMPANY

1640 Fourth Avenue
CHARLESTON, WEST VIRGINIA
Telephone 3-0735

FOR SALE**4—KOEHRING DUMP-TORS**

overhauled and in good condition

PRICE \$3,380 EACH

ANDERSON EQUIPMENT CO., INC.

Second Floor
Merchants National Bank Bldg.
OMAHA 2, NEBRASKA
PH. HARNEY 2533

D7 CATERPILLAR

DDPCU STRAIGHT BLADE
Low Hours \$13,500

UNUSED AIR COMPRESSORS

- 1—315 CFM Worthington D8800 Cat. Engine, Pneumatic Tires \$5,750.00
- 2—with Pneumatic Tires, \$2,450.00
- 2—with Steel Wheels, \$2,250.00
- 2—1/4-yard Maxi-Mile Wagon Cranes \$22,500.00
- 2—UNUSED UNIT Wagons, Cranes, 12 tires, 25-ton capacity, \$22,500.00 each.

REX TRAILER CO., INC.

MAIN OFFICE
P. O. Box 203 Dallas, Texas
Tel: Riverside 5648

FOR SALE

1 50-ft. Lippman Conveyor, completely enclosed swivel turnhead, gasoline powered. Excellent condition. Reasonable.

THE BODE-FINN CO.

2650 SPRING GROVE AVE.
CINCINNATI, OHIO MULBERRY 2200

WE'RE STILL ABLE TO SUPPLY YOU!

This is Our Ninth Shipload of Hard-to-Get Gov't Surplus

CONSTRUCTION EQUIPMENT

CRANES - TRACTORS - FORK LIFTS - COMPRESSORS
GENERATOR SETS (DIESEL & GAS) - DITCHERS
MOTOR PATROLS - ROCK CRUSHERS - TOURNAPULLS



SHOVEL FRONTS - CLAMSHELL BUCKETS - DRAGLINE BUCKETS - DOZER BLADES - SHEEP'S FOOT TAMPERS

TRUCK PARTS

GMC - INTERNATIONAL - DODGE - AUTOCAR - JEEP
DIAMOND "T"

BUY
DIRECT
AND SAVE

DUAL DRIVE UNITS - TRUCK MOTORS (Diesel & Gas)
TRANSMISSIONS - TRANSFER CASES

REAR DRIVE UNITS - FRONT DRIVE UNITS - HUBS
DRUMS - AXLES - PILLOW BLOCKS - DRIVE LINES
POWER TAKE-OFFS

CALL OR WRITE US FOR ALL YOUR TRUCK NEEDS

← NOW, TWO CONVENIENT LOCATIONS →
PHONE TODAY! DEAN BROS. WRITE TODAY!

911 Ferry St.
Oakland, Calif.
•
TEMPLEBAR
6-0552

BUY-RITE TRUCK
& EQUIPMENT INC.

3645 Jensen
Drive
Houston, Tex.
•
BLACKSTONE
6641

1918 1951
CONSTRUCTION EQUIPMENT
New and Used

Sales—Rental—Service**ALL EQUIPMENT & TOOLS
for**

Contractors and Industrials

Joy Air Compressors, Tools

Portable Air Compressors and Tool
Rentals Our Specialty

Tex Chain Belt Truck Mixers,

Pumps and Pumpcrete Machines

Felker Di-Met, Concrete Cutter

Noble Co., Bins, Batchers, Cement

Plants and Aggregate Conveyors

Leschen Wire Rope

**WESTERN
CONTRACTORS
SUPPLY CO.**

Van Buren 6-6363

3145 W. Lake St.

Chicago 12, Ill.

**USED EQUIPMENT
FOR SALE**

2—Shovel Fronts for 1/2 Yd. Bucyrus-Erie Type B Steam Shovels, Booms, Sticks and Dippers.

Condition: Excellent.

Price: \$600.00 each.

1—Electric Convector, Model FCE8 Reliance, 1 1/2 H.P.—8 KVA—440 V.—60 Cy.—3 Phase Continuous 40°C RPM 900.

Condition: Good.

Price: \$350.00.

1—Roll Crusher, Martin 18" Style F Condition: Good.

Price: \$400.00.

2—Well Drills, Loomis Model 44 Clipper Full Crawler Blast Hole. Gasoline Powered.

Condition: Excellent.

Price: \$4,500.00 each.

1—Scale, Exact Weight Style No. 2226, 10 lb. Tare Beam, Dial 25 lb. Under 5 lbs. Over with Dustite Bag-holder.

Condition: Good.

Price: \$200.00.

THOMASVILLE STONE

& LIME CO.

Thomasville, Pa.

J. K. WHEELER MACHINERY CO. Used Equipment Inventory List

Item No.	Quan.	Description
1.	1	1500 Gallon Ethylene Bituminous Distributor with 10' x 10' Bituminous tank, mounted on 10' wheel KBB IHC Truck—Both truck and distributor very little used (200,000 Gal.)
2.	4	5-6 Ton Mack Gasoline Four-wheel Drive—Dual on Rear—Co. Td. Dump Beds—2' Hopper—Tandem Telescopic Type Hoist—Haro is a deal for some one who has use for these units.
3.	1	STANDARD, Almost New 1500 Lb. Back Stationary Bituminous Oil Plant, complete with Tanks, Steam Boiler, D1000 Cafeteria, 8' x 12' Room, portable skid mounted, with 5th Wheel arrangement on each unit, with set of Dollies for easy, quick moving. "PRICED TO SELL!"
4.	1	Adnum 12' Lay-Down Machine—very little used.
5.	2	12' Buckeye Spreaders with Agitators; equipped with 6' wheels—very little used.
6.	1	Model LS-95 L-8-5 Shovel & Dragline Combination, powered with D1000 Engine and equipped with 1 yard buckets.
7.	1	Model YR 12-15 Yard LeTourneau Scraper.
8.	1	Model LS-8-11 Yd. LeTourneau Scraper.
9.	1	1500 4 Compartment Fuel Tank mounted on Dodge Truck, with air Compressor and Air Actuated Lubricating equipment.
10.	1	Heavy Duty 3 Tooth Road Rooter—A/C condition.
11.	1	Model LP 12-15 Yd. LeTourneau Carryall Scraper—Almost new.
12.	1	DB Caterpillar Tractor, 1H5265 SP with Angledozer and with 2 Drum LeTourneau Power Unit.
13.	1	D7 Caterpillar Tractor, 9G1358 SP with Bulldozer & 2 Drum La. Power Unit, BH 1464CS0, AT "GIVE AWAY PRICE."
14.	1	D7 Caterpillar Tractor, with Bulldozer & 2 Drum La. Power Unit. Old, but offered at "GIVE AWAY PRICE."
15.	1	12 Yard LeTourneau Carryall Scraper, 2661Y12.
16.	1	8 Yard LeTourneau Carryall Scraper, 508J.
17.	1	D10 Caterpillar Auto Patrol, 9F1043-BH89.
18.	1	Seaman Pulverizer, Model MHD-72, with extra set of fines.
19.	1	Model S11 Diesel Adams Motor Grader with 12' blade—in running condition.
20.	1	1941 Diamond T Dump Truck, Model 968-A-0239, Motor No. 130219, Serial No. 96840288—with Winch & A Frame for Derrick.
21.	1	Jaeger 7-5 Concrete Mixer, Model TEL-AP, Serial No. 71969.
22.	1	Model 70 Buckeye 1/2 Yd. Shovel & Dragline Combination, Serial No. 4964-W-97207. "NEAR NEW."

J. K. WHEELER MACHINERY CO.

1485 South 2nd West
SALT LAKE CITY, UTAH

PHONES 6-1212, 6-3431, 6-1514

FOR SALE

1 7-5 Construction Machinery Co. "Mastermizer" driven by 2 cyl. LeRoi gas engine, trailer mounted on 2 rubber tired wheels.

2 7-5 Construction Machinery Co. "Wondersmizer" driven by 2 cyl. LeRoi gas engine, trailers mounted on 4 rubber tired wheels.

1 105 CFM Schramm portable compressor driven by Buda gas engine, trailer mounted on 4 steel wheels.

2 310 CFM Gardner-Denver portable compressor driven by Buda gas engines.

3 15 KW Diesel Electric Generating Units, Century 4-wire generators driven by Waukesha-Hesselman Diesels.

1 30 KW Diesel Electric Generating Unit, Century generator driven by Buda Diesel.

1 74 KW Caterpillar Diesel Electric Generating Unit, Model D-1000.

**Mining and Milling Machinery
Construction, Electrical and Industrial
Equipment**

Morse Bros. Machinery Co.

Established 1878

2900 Brighton Blvd., Denver, Colo.
Phone KEston 5261

TAKE ADVANTAGE of equipment demand HAVE AN AUCTION

FORKE BROS., & FICKE

314 Sharp Bldg.

Lincoln, Neb.

REX DUAL DRUM PAVER

Model 34E. Model duomatic, powered with 6-cylinder gasoline engine. Rex mechanical man, batchmeter, 35' distributing boom. Serial #GG-128. Completely reconditioned, ready for paving. Price on application, subject to prior sale. Can be seen at our Philadelphia warehouse. Write, wire, visit.

FURNIVAL MACHINERY CO.
54th & Lancaster Ave., Phila. 31, Pa.

FOR SALE

1—D7 Caterpillar tractor with bulldozer and angledozer combination, double-drum winch.

1—D7 Caterpillar tractor with LeTourneau bulldozer & bulldozer combination, double-drum winch.

1—RD7 Caterpillar tractor with LeTourneau bulldozer & bulldozer combination, double-drum winch.

1—L8 LeTourneau scraper, 8.2-11 yd. capacity, has not moved 3,000 yds. dirt.

1—LeTourneau double-drum sheepfoot roller.

1—LeTourneau scarifier or rooter.

1—Rex 11-8 (2-bag) mixer.

1—Adam's gas motor grader, new motor just installed, new rubber used very little.

1—Federal truck, new motor.

1—Chevrolet dump truck, four-wheel drive, new motor.

7—wheelbarrows.

3—Georgia buggies.

1—pair concrete scales.

1—750 gallon water tank, sprinkler attached.

1—hand saw.

1—bench saw.

1—Kohler light plant.

Have many other pieces too numerous to mention. All above equipment is 85 to 90 percent as good as new.

BERNAM ADAMS

WINCHESTER, KY.

Phone 51

FOR SALE

1—7 ton Plymouth gas locomotive, \$1400.

1—Symons double deck vib screen, \$600.00.

1—Worthington Pump with Motor, \$450.00. 60# Frog & switch points & G rails, \$12.00.

Numerous Motors—All this equipment in very good condition.

WAPAK SAND & GRAVEL CO.
WAPAKONETA, OHIO

FOR SALE

1—Chicago Pneumatic 315' air compressor, steel wheels.

1—Youn $\frac{1}{4}$ yd. dragline bucket.

1—Williams $\frac{3}{4}$ yd. dragline bucket.

1—Cleveland DR30 wagon drill.

1—Jackshaft 8' $\frac{7}{8}$ with 2 V pulleys, 8 groove 15" PD & 2 pillow block bearings, 3-15/16 bore.

2—Solid tire axles.

Above can be seen at Millington, Ill., or phone Marseilles, Ill., Green 510, evenings.

HARRINGTON STONE CO.
MILLINGTON, ILLINOIS

FOR SALE

1—365 Gardner-Denver Diesel Air Compressor.

1—Cleveland Wagon Drills.

1—LeTourneau Tandem Tractor Cable Doser, with double drum power unit.

2—404 Rome Blades, Hercules Diesel.

1—13 cu. yd. bottom dump Euclid.

1—Caterpillar DW-10 with bottom dump wagons.

1—Harrington 10' x 10' x 10' foot circular inside diameter concrete structures.

4—Sets 22 foot inside barrel forms.

2—Sets Travelers.

2—Sets 22 foot outside barrel forms.

Available on Rental Purchase Option

KEARNEY, CRUME & CO.

1961 North Industrial Boulevard

Dallas, Texas

Phone PProspect 5672

BAKLEY BROTHERS

PHONE 3431 HUNTERLY, ILLINOIS

FOR SALE

Caterpillar D8
Cable Dozer
Serial No. 2U 10457, 1950

With cat. straight blade and DOPCU mod. 25 condition and appearance like new.

Bucyrus Erie 15B 1950, Buda Gas
 35 ft. crane boom, fairlead and dragline bucket also backhoe attachment, special cats. Machine practically new. Address

JOHN DEL BENE
 57 Belmont Ave. Yonkers 4, N.Y.

FOR SALE

I. Caterpillar D8, Dozer, and P.C.U. Serial No. 2U 10457, 1950
Caterpillar D9 and P.C.U. Serial No. 2 U 5486, New Style Transmission, and LeTourneau FP Scraper with 2100 x 24 tires rear, 1800 x 24 tires front. Price \$18,500.00 Located at Murdo, South Dakota.
I. Northwest Model 25 Dragline, Serial 10208 with Cat D460 motor. Price \$10,500.00.
I. International TD-14, new in '49, used 3000 Hours. Serial No. TD6276. Price \$5,500.00.

SCHULTZ & LINDSAY
CONSTRUCTION CO.

621-151 AVENUE N.
 FARGO - - - NORTH DAKOTA
 PHONE 6869

FOR SALE

Truck Crane: 1931 Universal Crane with New Waukesha Engine mounted upon a 1927 Mack Truck. Crane equipped with a 50 foot sectional boom; 8 way jib; 10 ft. jib; 10 ft. jib; 10 ft. jib with pneumatic tires. Gross Weight—35,000 lbs.

Pump: 100 H.P. Allis Chalmers A.C. Motor with 6" suction and discharge. Mtg. by Alberger Pump & Condenser Co. Capacity 750 gallons per min.

Pumps: Various Sizes of Horizontal Duplex Pumps manufactured by Worthington, Warren and Dean.

J. COWHEY & SONS

440 Van Brunt Street
 Brooklyn 31, N.Y.
 MA 5-5587

For Sale or Rent**1—N.W. Shovel**

2½ c.y. Model 80-D
 New late '46. Used 2½ years.
 Serial Number 8931

1—N.W. Shovel

1½ c.y. Model 6
 New in '46. Used lightly.
 Serial number 8817

Both machines in excellent condition

Williams Construction Co.
 Box 145, Baltimore 20, Maryland
 Telephone Essex 1370

FOR SALE

D-8 with 85 "Caterpillar". 3000 hrs.
 ¾-yd. crane and backhoe, Diesel.
 Model M 6 to 7 yd. LeTourneau scoop.

All in excellent condition.

J. P. Wetherby
Construction Co.

1016 W. Superior St. Ottawa, Ill.

NOW AVAILABLE!

1—D8 Caterpillar Tractor w/dd pcr and dozer.....	\$ 5,500.00
1—No. 12 Caterpillar Motor Patrol.....	6,000.00
2—Super C Tournapulls.....	Each 7,000.00
1—4000 Gallon Dart Sprinkler Truck—Diesel.....	9,000.00
1—400 KW Enterprise Dual Fuel Gen. Unit.....	35,000.00
1—21 Shank Southwest Scarifier.....	1,500.00
1—New Model HSL Buda Earth Drill.....	5,000.00
10—26.7 cu. yd. Southwest Bottom Dump Trailers w/200 HP Peterbilt Diesel Tractors.....	Each 16,500.00

Above equipment located at Republican City, Nebraska

Following Equipment located on West Coast:

3—No. 12 Caterpillar Motor Patrols.....	Each 37,500.00
2—No. 67W Bros Pneu. Tired Rollers—13 Wheel.....	Each 1,000.00
3—Mod. W. LeTourneau Carryalls—Duals.....	Each 6,000.00
1—C86 LaPlant Choate Scraper.....	2,750.00
1—34E Ransome & Dual Drum Paver—Diesel.....	14,500.00
5—4 cu. yd. Dumpcarts Bodies—Moxon.....	Each 1,500.00
15—20 cu. yd. Western End Dump Trucks—Diesel.....	Each 7,750.00

All offerings subject to prior sale

!! DEALER INQUIRIES INVITED !!

For complete list of available equipment for sale, contact:

GUY F. ATKINSON COMPANY

10 West Orange Avenue — South San Francisco, Calif.
 Phone — JUniper 4-8120 — Extension 107

or

HARLAN CONSTRUCTION COMPANY
 Republican City, Nebraska Phone Republican City 101

FOR SALE

AIR COMPRESSOR—Gardner-Denver: 500 C.P.M. Powered with Caterpillar D-13000. Same as new. 630 hours running time.

AIR COMPRESSOR—Gardner-Denver 365 C.P.M., powered Caterpillar D-13000, excellent condition. 2,300 hours running time.

GENERATOR—Louis Allis powered Caterpillar D-3400. 240 KVA, 220 volt, three phase.

POWER UNIT—Caterpillar D-3400.

PUMP—Jaeger 40-M with 4-inch suction hose.

PUMP—Rez, 20-M.

HOISTS—Two gasoline powered. One electric.

ELECTRIC MOTORS—2 to 15 H.P. Single and three phase.

**ALL EQUIPMENT READY TO GO
 EXCELLENT CONDITION**

JOHN W. MARR
 LEXINGTON, KY.
 BOX 315 — PH. 2-5583

FOR SALE**SUBJECT TO
 PRIOR DISPOSITION**

Lima 1201 High Lift Shovel, Long Crawler, wide track, Cummins Type L Diesel, 42' Boom, 32' Stick, 2½ cu. yd. Dipper. Very good condition. Serial 3131.

\$42,000 FOB Johnstown, Pa.

931 Marion 2½ cu. yd. Standard Shovel, Caterpillar D-17000 Diesel, 1500 Watt Light Plant, 2½ cu. yd. Dipper. Good condition. Serial 8780.

\$35,000 FOB Meadowville, Pa.

111 Marion. Combination Shovel, Dragline, 4½ cu. yd. Dipper, 80' Dragline Boom, Fenders, 5' yd. Hendrix Bucket. Two new Mowers, diesels. Good condition. New 1947. Serial 8605.

\$68,250 FOB Johnstown, Pa.

**Also Rear and Bottom
 Dump Euclids**

WILL CONSIDER RENTAL

3-C-11 Tournapulls with E-16 Scrapers. Machine and tires in good condition.

\$12,000 Each FOB Swedesboro, N.J.

FOR SALE

Model 120 Buckeye Ditcher (Practically new)

HD-14 Allis-Chalmers Cat Tractor equipped with 8-12 C. Y. LeTourneau scraper and Caterpillar dozer.

6-Ton Mack truck tractor—4 wheel drive, 1 45-ton semi trailer.

SWINGEN CONSTRUCTION CO.

Write Box 624

GRAND FORKS - - NORTH DAKOTA

Phone 45359

**S. J. GROVES
 AND SONS COMPANY**

19 Rector Street, New York, N.Y.

Whitehall 3-1055

COMPRESSORS

REBUILT I-R 315—Gas—4 Wheel Pneumatics. Excellent condition. Price \$4,500.00
 REBUILT WORTHINGTON — 310 — Gas—4 Wheel
 LE ROI 315—I.H.C. DIESEL—Used only four months
 LE ROI 500—Gas—D 13000 Diesel—Used only
 five months. Price \$9,975.00
 REBUILT JAEGER 250—Gas—4 pneumatic. 2 years
 LE ROI 210—Gas—4 Wheel pneumatic. Used 2
 months. Price \$4,500.00
 SULLIVAN 100—Gas—2 pneumatic. Price \$1,500.00
 LE ROI 210—Gas—4 pneumatic. Used 2 months.
 Price \$4,000.00
 REBUILT SCHRAMM 105—Gas—4 pneumatic.
 REBUILT SCHRAMM 50—Gas—2 pneumatic. Price \$1,200.00
 REBUILT LE ROI 60—Gas—2 pneumatic. Price \$1,000.00

MIXERS

NEW T. L. SMITH 115—2 wheel trailer. Price \$2,000.00
 REBUILT T. L. SMITH 115—2 wheel trailer—1949 machine. Price \$1,300.00
 REBUILT RANSOME 148—4 pneumatic. Price \$1,200.00
 FOOTE PAVER 27E—Gas—Good Condition. Price \$2,500.00
 KOEHRING MIXER 165—Slightly 1 Yr old. Price \$2,500.00

ROLLERS

5 ton 3 Wheel GALION ROLLERS, gas, rebuilt. \$1,400.00
 3 to 5 Ton TANDEM GALION, gas. 2 years old. \$2,500.00
 5 Ton 3 wheel HUBER, gas. Rebuilt. \$2,500.00
 7 Ton 3 wheel GALION, gas. Rebuilt. \$2,200.00
 10 Ton 2 wheel GALION, gas. Used. \$2,800.00
 10 Ton 2 wheel HUBER, gas. Used. \$2,800.00

TRACTORS, DITCHERS, SCRAPERS

CASE rubber tired tractor with HOUGH 1/2 yd. front end loader. \$1,475.00
 MINI-MOLINE, almost new 1/2 yd. front end loader. \$3,400.00
 Rebuilt Model DD CLETRAC 65 h.p. diesel crawler with 1 1/2 yd. front end loader. \$4,500.00
 REBUILT MINI-MOLINE UTV, gas, 47 h.p. \$2,800.00
 Leader and Fork Lift. \$2,200.00
 Rebuilt HD 7 ALLIS CHALMERS 1946 diesel crawler complete with Hydraulic Bulldozer, excellent condition. \$6,500.00
 Rebuilt TD-9 IM diesel crawler with dozer blade. \$4,875.00
 Almost new LE TOUREAU Model D 4 cubic yard, rubber tired crawler. \$1,900.00
 BADGER Ditcher, gas, crawler, will dig 8" deep. \$2,500.00

Road Building,
Construction and
Industrial MachineryGIL BOERS
EQUIPMENT COMPANY

7625 S. KEDZIE AVE.
CHICAGO, ILL.

FOR SALE

1—Galion International Power Petrol Motor Grader
 Late model 2 years old
 Perfect Condition, Like New

Sacrifice \$7,500

OTTO WIESNER
SUPERIOR, WISCONSIN
Ph. 6446

FOR SALE
DIESEL EQUIPMENT
IN GOOD OPERATING CONDITION

Located in Arkansas

SHOVELS—2 1/4 yd. Lima High Lift 1201 & 2 yd. Bucyrus-Erie 448.

DRAGLINE—2 1/4 yd. Lima 801

BULLDOZER—D8 Caterpillar

THE NEW ENGLAND
INDUSTRIES, INC.

39 Broadway - New York 6, N. Y.
Phone: Whitehall 3-1987

FOR SALE

1—CATERPILLAR Model 212 Diesel Motor Grader, Serial No. 1R664. 1-1/2 Condition.

1—CATERPILLAR D8 Tractor equipped with LeTourneau Bulldozer and Double Drum Cable Control Units. Good Condition.

1—Model 103 McCARTHY Horizontal Drill With Ford 4 cyl. Power Unit.

Locations—Harrisville, Pennsylvania

E. N. TURNER & SONS

Phone: 781

A BARGAIN IN EUCLIDS

Eight (8) Model 25 FTD EUCLIDS with Bottom Dump Trucks. 165 H.P. Cummins Diesel Engines. 10 units rebuilt within the past year, in fine working operating condition. Tires ranging from good to excellent. Will sell individually or in one lot.

Write or phone for prices.

H. O. PENN
MACHINERY CO., Inc.
140th Street & East River
NEW YORK 54, N. Y.
Telephone: CYPRESS 2-4800

FOR SALE

FOOTE — 27E Paver — Good condition \$2000
 Can be inspected at VPI, Blackburg, Va. Must move soon.

We can use back-hoe front for Erie 10-B

DONALD H. SELVAGE
General Contractor
AMHERST, VIRGINIA

FOR SALE

Model K14 INSLEY Backhoe, Gasoline Motor, 30" Bucket, 24" Shoe, Extra Long Tracks, Exceptional Condition \$8,200. BYERS 1/2 cu. yd. Shovel, Gasoline Motor, Rebuilt and Painted, Good Condition. 45 ft. Crane Boom for M-3 N. W.

Dryden Supply Co., Inc.
Dryden, N. Y.
Ph. 177

FOR SALE

334 Koehring Dual Drum Paver
 Available Immediately

BOOTH & OLSON, INC.
SIOUX CITY, IOWA

MOTOR GRADERS

Rebuilt CAT 11 diesel tandem drive, completely rebuilt engine, scarifier, cab, with 4 new 13.00 x 24 tires. \$11,500.00
 REBUILT GALION 102 diesel tandem drive, new 13.00 x 24 tires, scarifier, 70 h.p. UD-14A, 2 years old. \$8,500.00
 REBUILT ADAMS 81 Diesel, tandem drive, 10 h.p. \$1,800.00
 REBUILT GALION 101 gas engine driven motor. \$2,000.00
 REBUILT ADAMS 811 diesel, tandem drive, UD 14 diesel, cab, scarifier, 13.00 x 24 tires. \$4,500.00
 REBUILT 101 GALION diesel, tandem, scarifier, 13.00 x 24 tires. \$4,350.00

HOISTS, TOWERS, CARPULLERS

New CLYDE Builders Tower HPBT with double drum hoist, 100 ft. Tower, Chicago Derrick Boxes. \$3,689.00
 CLYDE HPBT same as above, used 6 months. \$4,500.00
 New CLYDE Cat. 5000 Model A Capstan Hoist with 15 h.p. motor, starter. \$1,520.00
 Used CLYDE Hoist Double Drum, Gas, 3500 L.P. \$800.00

CRANES

CLYDE Handi-Crane 3 ton, gas, rubber tired. \$3,200.00
 P&H 255 A Gas Crawler, Trench Hose, 30' 6" yd. Used 3 months rental. \$13,500.00
 BYERS 83 Cat. D318 Diesel, long crawlers. 24" shoes, clam drag, 1946. Rebuilt. \$15,750.00

WELDERS

4—New P&H 200 Ampere Gas Driven Welders, 2 Wheel Pneumatics. \$1,400.00
 New LINCOLN 300 Ampere, electric driven Welder. \$610.00

TRUCKS WANTED

Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus. Write, phone or wire:

BILL FISHEL

VANDEVENTER AUTO SALES
717 So. Vandeventer Ave., St. Louis, Mo.
PHONE FRANKLIN 1750

GOOD BUYS IN
USED EQUIPMENT

2—Allis-Chalmers HD14 Tractors, 48" Tread, 22" Shoes, with Baker bulldozers. Real buys.
 1—International UD-9 Power Unit, completely rebuilt. Guaranteed.
 1—Jaeger 11-1/2 cu. yd. concrete mixer, Continental gas engine, on two 7.50 x 16 tires. A good buy.

DON'T WAIT. Write, Wire or Call

THE W. W. WILLIAMS CO.
835 W. Goodale Blvd., Columbus 8, Ohio
Main 6751, L.D. 1

FOR SALE

Used Badger trenchers. Both rubber tire mounted.

1—Badger trencher Model M-202.
 1—Badger trencher Model 202-B-MS.

GREAT LAKES
CONSTRUCTION CO.

25 E. Jackson Blvd. Chicago 4, Ill.
Phone: WEbster 9-4714

CLEARING HOUSE

FOR SALE

CEBARAPIDS SUPER TANDEM Tavel Plant. Late model. Serial No. 4182. 10' x 24' RB. Jaw Crusher, 24" x 16" Double Roll, 4' x 14' three deck Screen, 30' Feeder Conveyor and others. Complete. Replacement cost over \$40,000.00. Our price \$18,000.00.

ROGERS 26" x 36" RB. Jaw Crusher with Apron Feeder. A-1. \$7,000.00.

IOWA 21" Conveyor, 60 ft. long, complete with gear reduction box. Practically new. Good belt. \$1,350.00.

UNIVERSAL 18" Conveyor, 28 ft. long, complete with gear reduction box. New. Including belt. \$850.00.

IOWA 25 cu. yd. Jack-leg bin. Like new. \$600.00.

SIMPLICITY 3' x 10' 2-deck Vibrating Screen. Good. \$1,000.00.

4' x 8' 4-deck with 10 H.P. Electric Motor. Like new. \$1,000.00.

SECO 18" x 18" 2-deck Vibrating Screen. Good. \$1,350.00.

NORTHWEST No. 25. 5% cu. yd. Backhoe. Swings tracks. Bought new last fall. Used little. Looks and runs like new. \$15,500.00. Rental purchase. Can also furnish dragline boom.

P. & H. No. 555-A. 1/2 cu. yd. shovel-dragline complete. Serial No. 1000. Cat. Diesel. Backhoe recently rebuilt. Guaranteed. \$17,000.00. Rental purchase.

LIMA No. 602 Diesel. Swings tracks. Rebuilt at a cost of over \$17,000.00. Now ready. Looks and runs like new. \$14,000.00. Rental purchase.

LINK-BELT SPEEDER LS-50 1/2 cu. yd. shovel-dragline. Ser. No. L550-50454. Cat. Diesel. Good. \$6,500.00.

BLAW-KNOX No. 672 Gm. Purpose Clamshell bucket. 1/2 cu. yd. New. \$850.00. Also No. 680 1 cu. yd. Rebuilt. \$600.00.

HENDRICK 1/2 cu. yd. Standard Dragline bucket. A-1. \$400.00.

BADGER No. 203 Ditcher. 20' buckets. Cap. 12 ft. Used little. Model. \$1,750.00. Rental purchase.

PARSONS No. 310. Ditcher. Diesel. New 1948. Excellent. \$15,000.00.

HUBER & AUSTIN-WESTERN 16-ton 3-wheel Gino Rollers. Good condition. \$2,000.00.

GERHARD 2-drum Sheepfoot Rollers. Unused. \$1,000.00.

CATERPILLAR D-13000 and D-17000 Diesel Power Units. Overhauled. Guaranteed. \$3,000.00 and \$1,750.00.

ADAMS No. 412 Diesel Tandem Maintainer. Rebuilt. Looks and runs like new. \$1,500.00.

CAT. No. 12 Diesel Tandem Maintainer. Ser. 77400. Diesel. \$8,000.00.

BUCKEYE model RB. Fine Grader. Good. \$2,000.00.

JAEGER type H. Finishing machine. 20 to 23'. A-1. \$3,000.00.

BUTLER 30-ton Batch Bin complete with scales etc. Good. \$8,750.00.

CECILIA Roadmix Travelling Plant. Cat. 13000. Good. \$8,750.00.

WENZEL MACHINERY RENTAL & SALES CO.

2136 Jefferson Street
Kansas City, Mo.
Tel. Harrison 0021

FOR SALE OR RENT

6—MODEL A ROADSTER TOUNAPULLS
4—with E-25 Scrapers (18-22 yd) 24x29 36-ply tires. Worked 9 mos.
1—with E-25 Scraper (18-22 yd) 27x33 30-ply tires. Worked 6 mos.
1—with E-35 Scraper (25-28 yd) 27x33 30-ply tires. Worked 6 mos.

Operating at present near Pierre, S. Dak.

WILLIAM COLLINS & SONS, INC.
514 Black Bldg., Fargo, N. Dak.

FOR SALE
Used 1/2 Strayer Concrete Mixing Plant, 3-compartment—Electric Motor. Located at Port Chester, New York. \$2,000.00

PECKHAM ROAD CORP.
50 HAARLEM AVENUE
WHITE PLAINS, N.Y.

FOR SALE

1—28 Cu. Ft. Knickerbocker Building Mixer with Continental Gas Engine & Paver Type Skip—\$3,800.00.

1—27-E Multi-Foote Paver with Continental Gas Engine, Boom & Bucket—\$3,500.00

Both in excellent condition. May be inspected at our warehouse

THE DAY & MADDOCK CO.
8201 Almira Avenue, Cleveland, Ohio

NEW EQUIPMENT

Only Used A Few Days

Blower, Roots Connerville 10" x 10" 417 CFM V-belt drive.

Bunker, 16" dia. x 20' high, 1/4" plate steel cone bottom, rotating plate feeder.

Compressor - Gas. Worthington type HB 26" x 13" 1150 RPM. 1000 CFM. Multi V belt drive, controls and starter.

Char Crusher, Komarek Gravem. 24x12 hammermill 20 HP motor, V-belt drive, line starter.

Circuit Breaker, DEION, D430, 600 V. AC, 800 amps.

Elevator, Link Belt. 16" dia. buckets 7" x 14" spaced 24" 40' centers. 7 1/2 HP motor, Jones gear reduction.

Excavator, D-10, bucket 12" x 14", spaced 22" 29" centers, motor 120 cu. yd. 5 HP motor.

Gas, Exhausters (2). Sturtevant 25 design 2 form M 10" flanged inlet and outlet.

Transformers: (3) GE 30 KVA. 2200/220/110 volt.

Macerator, Komarek Gravem 36" x 36" x 23" CI ends Rock shell. Dbl shaft 10 hp Moto 220/440 1150 RPM. V-belt drive.

Master Gear Head Motor. (3) 1 HP, 1775 RPM.

Gas Burner (2) Series Combustion Corp. Vi-1 with Webster Universal Pilots and mounting brackets.

First Investment Corp.

301 First Avenue Bldg.,
MINOT, NORTH DAKOTA

FOR SALE

1—Generating Package Unit, 35 KW, 1200 RPM, 60-cycle, 3-phase, with switchboard, ammeter, volt meter, voltage regulator, ebony asbestos, on floor stand. Rebuilt and guaranteed.

STATE DISTRIBUTORS

CUMMINS DIESEL SALES CORP. OF OHIO

113 N. Wooster Ave. Dover, O.
Phone 4-2351

DIRECT SALE

Bucyrus-Erie 488 Shovel & Dragline combination 2 1/2 yd. bucket now flagged as shovel. New Bucyrus Erie 45' dragline boom. Price to move immediately.

Northwest Model B Dragline 65' boom 2 1/2 yd. bucket. Murphy Diesel engine wide swamp cuts. Excellent Condition.

Lorain model 75A shovel 1 1/2 yd. bucket Waukesha engine. Bargain.

D8 Cat tractor-bulldozer LeTourneau attachment.

Other equipment drills 6D1742 Diesel engine.

J. L. BOOTS

Box 13 Phone 525, LaFollette, Tenn.

REPAIR PARTS FOR

BATES & EDMONDS, FAIRBANKS, BULLDOG GAS & OIL ENGINES, IOWA-ASSOCIATED ENGINES AND OTHER MAKES. WE SELL NEW ENGINES & PUMPS

W.H.W. MACHINE & TOOL CO.
406 Olds Ave., Lansing, Mich.

FOR SALE

Adams Model 610 Motor Grader. Low hours. Completely rebuilt. An excellent machine for any contractor.

Two Caterpillar W10 Wagons for use with late style DW10 Tractors. Have had very little use. Excellent condition.

Two I.H.C. Model TD18 Tractors equipped with H.E. cable units and cable dozers. Completely rebuilt.

GIBBS-COOK EQUIPMENT CO.

1314 Walnut Des Moines, Ia. 325 No. Jackson Mason City, Ia.

FOR SALE

One Model 514 Unit Shovel, 1/2 cu. yd. Good condition. \$3,850.00

One Model 3400 Caterpillar Diesel Engine, directly connected to 15 DW DC Generator. \$2,750.00

Two Sterling Diesel Stationary Engines, 70 H.P. Each. \$1,200.00

One Double Drum Control Unit, for Model HD-10 A.C. tractor, new. \$750.00

One Shovel, Model 255-A P-H Shovel.

One Browning Self-Propelled Crane Model W-158 20 ton, ten tires, excellent condition, cost new over \$30,000.00.

One Model D-2 Caterpillar Tractor with Hyd. angledozer, and D2 logging winch. \$14,500.00

KENDRICK MACHINERY 894 N. STATE ST.

UKIAH, CALIF.

FOR SALE

1—Yale Elec. Lift Truck which includes 1 set of wet storage batteries. 2000 lbs. of lifting capacity. Price, f.o.b. Green Bay. \$3,000.00

1—Jaeger Model 1A single drum Dixie Special Hoist, complete for 3500 lbs. line pull at 240 F.P.M. Power, 1/2 H.P. Wisconsin AP4 Engine. Price, f.o.b. Green Bay, Wisconsin. \$350.00

1—Jaeger Model 2A3 double drum Dixie Special Hoist, complete for 3500 lbs. line pull at 240 F.P.M. Power, 1/2 H.P. Wisconsin AP4 Engine. Price, f.o.b. Marquette, Michigan. \$1200.00

1—Hough Model D1 front end loader with hydraulic bucket control. 1/2 cubic yard bucket included. Price, f.o.b. Marquette, Michigan. \$1150.00

1—Plant-Crane model 1000. Weight 10,000 lbs. 40' 60" trailer. Hydraulic pump included. Price, f.o.b. Marquette, Michigan. \$1500.00

1—Fisher Hydraulic rubber carrier with 0.25x20 tires. Includes Hydraulic pump. Price, f.o.b. Marquette, Michigan. \$1500.00

1—Hough Model 27B Retractable scraper. Price, f.o.b. Green Bay, Wisconsin. \$175.00

—All Equipment subject to prior sale —

BREBNER MACHINERY CO., INC.

GREEN BAY, WISCONSIN

Phone Adams 1515

FOR SALE

3—Mississippi wagons, 9 1/2-yd. capacity.

1—20-ton locomotive crane, steam.

1—50-ton 80' lattice boom.

1—100-yd. Omaha dragline bucket.

1—30-yd. 2-compartment ground bin.

1—10-ton 3-wheel Galion roller.

1—45' crane boom for Manitowoc Speed-crane.

Above priced for quick sale

FIELDING & SHEPLEY, INC.

1258 Bohm Ave. St. Paul, Minn.

MEstar 7878

Allis-Chalmers Tractors

3 HD 10W Tractors, with 471-RC-5 GMC diesel engines, new LeTourneau power-control units. Gar Wood blades, 2 straight, 1 angle. Excellent condition. One at our Harrisburg Plant, North Cameron and Foster; others at address below.

ATHEY WAGONS

3 EB-32, for use with above, 13 yd. capacity, in good condition, including hydraulic equipment.

FURNIVAL MACHINERY CO.
54th & Lancaster Ave. Phila. 31, Pa.

FOR SALE**Available Immediately**

1 LeTourneau Super C Tarma-Dozer #2784, operated by Buda diesel engine, having four 21.00 x 25 16-ply tires. Price \$21,000.00.

BUCKYER ERIE 34-B STANDARD SHOVEL WITH 60' CLAMSHELL BOOM

THE W. I. CLARK CO.
P. O. Box 301 New Haven 2, Conn.

FOR SALE

1946 INSLEY K-12 Dragline
1/2 yd. \$6,800
1948 INSLEY K12 Backhoe
1/2 yd. \$7,500.00
331 Marion 1/2 yd. Dragline
\$7,900.00
Bay City K-2 Shovel 1/2 yd. \$3,800.00

DEPCO DETROIT CORP.

1820 Kales Building, Detroit
Ph. Woodward 1-9103

FOR SALE

1/2 yd. Insley Backhoe.
D2 Caterpillar Tractor.
Caterpillar No. 10 motor patrol.
Limestone crushing plant, Gruendler 30-38, Caterpillar 446 truck with new 9-ton lime box.
Reo 666 truck with new 9-ton lime box.

CLARENCE J. GRIFFITHS

South Beloit, Illinois
Phone South 273 or South 2289

FOR SALE

2-4' x 8' Single Deck New Holland vibrating screens with motors.
1-12' x 16' New Holland cinder crushing rolls—rebuilt.
1-26, 12' x 24' Good Roads jaw crusher. Repair parts for the former New Holland line of crushing equipment.

AGGREGATES EQUIPMENT CO., INC.
P. O. Box 818
Lancaster, Pennsylvania
Phone: 3-9867

FOR SALE

#112 Caterpillar patrol grader
Serial # 2M796
Excellent condition
Price \$5500.00
Can be seen at our shop—Bardstown, Ky.
SALTSMAN CONSTRUCTION COMPANY
BARDSTOWN, KENTUCKY

TRACTORS

Caterpillar "D-8" 2-U Series, 3500 hours, Cat. Dozer, DD PCU
International "TD-14" Used Diesel Tractor w/B-E Dozer
International "TD-40" Used Diesel Tractor w/New LePlant-Choate
C-44 4-yd. Hyd. Scraper, Bargain
Bulldozer Attachment—only—for Int. TD-14 Tractor w/DD PCU

CRANES & SHOVELS

Northwest "25" 1/4 yd. Used Diesel Dragline, 40' Boom
Quick-Way "15" 1/4 yd. Hoe or Dragline, mounted on White Half Track
Shovel Attachment only—for Unit "514"
Erie 1/4 yd. New Clam Bucket
Erie 3/4 yd. New Clam Bucket
Wellman "12M" 1/2 yd. New Clam Bucket
Daniels-Murtaugh 1/4 yd. New Drag Bucket @ \$800.00

MISCELLANEOUS

Diamond 21-yd. Straight Leg Bin. New
Rex "27E" Paver. Big Drum. Ready to pave
Rex "34E" New Paver, Dual Drum. Mechanical Man Controls

EICHMY EQUIPMENT COMPANY

120 S. Pierpont St. (US #20 West) Rockford, Ill.

**4-INCH FIRE HOSE**

Complete with male and female couplings. 200-lb. pressure, rubber-lined in 50-ft. lengths.

USES: Portable Fire Lines.
FIRE HOSE: Sewer
Trench work: Manholes;
Discharge on Pumps: Mines;
50-ft. length, complete with fittings
\$10.00

SALE PRICE
60 per Foot

• IMMEDIATE DELIVERY—ORDER NOW!

Phone COLLECT—your order will be shipped TODAY

BERNSTEIN BROTHERS
SINCE 1890—PHONE 5404
PUEBLO, COLORADO

FOR SALE**CONSTRUCTION EQUIPMENT****INCLUDING**

- SHOVELS and DRAGLINES
- DUMP and FLATBED TRUCKS
- EUCLIDS—COMPRESSORS
- POWER UNITS—PUMPS—TRAILERS
- SCRAPERS—TRACTORS
- SHOVEL and TRACTOR ATTACHMENTS

WRITE P. O. BOX 1428

BOISE, IDAHO

PHONE BOISE 6-700

M-SCOPE PIPE FINDER**MODEL AB****ONE MAN OPERATION****METAL CABINETS****HEAVY DUTY PERFORMANCE**

ONLY
\$149.50

FISHER RESEARCH LAB., Inc.
1962 University Ave., Palo Alto, California

FOR SALE

One 18 inch Barber Green conveyor 122 ft. length complete with belt with or without power. Priced very reasonable.

Write, wire or phone
HENRY SINDT
NAPOLENE, NEBRASKA

FOR SALE

Bay City 1/2 yd. crane, Model 30, 30' boom, heavy duty bucket. Only operated 300 hrs. New condition.

KEITH McELWAIN
Dahinda Illinois

FOR SALE**Buckeye Diesel Engines**

Mod. 80—4 cyl.—10 1/2 in. bore; 12 in. stroke; 210 H.P.—600 RPM. New. In original crates. See.

ALLAN MORTON

4661 W. Washington Blvd. Los Angeles, Cal.

CLEARING HOUSE

WANTED

We want to buy the following equipment:

- 10 New D8 bare or with dozers.
- 10 Used D8 ditto, in A-1 condition, with serial numbers 2U-10,000 and over.
- 2 New D7 with DDPCU and Angledozer.
- 3 New TD24 bare or with dozers.
- 10 New TD14 ditto.
- 3 New TD18 bare or with dozers.
- 1 D4 Bare, used, 1950 or 1951.
- 1 D6 Bare, used, 1950 or 1951.
- 1 New Bucyrus Erie 22B Shovel.
- 1 New Link Belt Speeder Mod. LS71, $\frac{3}{4}$ cu. yd. Dragline.
- 10 Well-drilling rigs, used or new.
- 1 HD15 with angledozer, new.

Telephone us collect if you have any D8's, only as listed above.

Always interested in Buying New Tractors and Road Building Equipment

Tractors For Export, Inc.

2 Maiden Lane
NEW YORK 38, N. Y.
Telephone: EEkman 3-7975

USED EQUIPMENT FOR SALE
IMMEDIATE DELIVERY

- 1—6-9 Ton Pierce Bear Roller. New.
- 1—2½-3 Ton Pierce Bear Roller. One month's use.
- 1—Huber Motor Grader. Two weeks' use.
- 1—77 Lorain Shovel. As is.
- 2—Gar Wood 26 Scrapers. New.
- 2—AD-3 Allis-Chalmers Motor Graders. One rebuilt.

GEORGE PARK TRACTOR CO.
1822 Houston Ave. Ph. IVY 951
MACON, GEORGIA

FOR SALE OR RENT

Bucyrus-Erie Model 29-B Shovel powered with "Caterpillar" D8800 Diesel engine	\$11,000.00
1 yd. dipper	
Bucyrus-Erie Model 19-B Combination Shovel, Crane & Dragline	\$7,500.00
Bucyrus-Erie Model 15-B Combination Shovel, Trenchhoe & Clamshell	\$9,000.00
International Model TD-14 Tractor w/Bucyrus Erie hydraulic bulldozer	\$7,500.00
Pioneer 1536 Roller Bearing Jaw Crusher, skid mounted	\$4,500.00
Lorain Model 30 Shovel powered w/Buda gas engine	\$4,750.00
Caterpillar Model D-8 Tractor w/LeTourneau bulldozer & DDPCU	\$9,000.00

EMMETT C. WATSON CO., INC.

310 E. Brandeis St.
LOUISVILLE 8, KY.
Phone: CAthoun 7448

1,000,000's OF GI TRUCK PARTS

Every part for every type military vehicles. One of the most complete stocks in America. Front axles, complete; front axle shafts, rear axle shafts, axle housing, differential assemblies, transmission assemblies, rear end assemblies, drive shafts, universal joints, pillow blocks, rings, pins and pinion oil seals and retainers, radiators, radiator hose, brake lining, hubs and drums, transfer cases, complete, transfer case seals, transfer case parts, all motor parts, cylinder heads, pistons, pins, rings, crankshafts, bearings, overhaul gasket sets, oil filters, cartridges, starters, generators, fuel pumps, voltage regulator, carburetors, fan belts, wheel, clutch, pressure plate assemblies, clutch plates, front and rear springs, steering assemblies.

MAIL ORDERS FILLED
Write—Phone—Come in

WILENSKY
AUTO PARTS CO.

1226-28 Washington Ave. N.
AT 4438 NE 3758
Minneapolis, Minn.

MILITARY TRUCK PARTS

Studebaker — Reo — GMC

6 x 6 and 6 x 4

Shipments made anywhere

WRITE FOR OUR NEW
1951 CATALOG!

New Trucks in Stock for Immediate Delivery

Service Equipment Company

1519 McKinley Ave. S.W.
CANTON, OHIO
Phone 64539

USED CONTRACTORS' EQUIPMENT FOR SALE

- 2—Thor Paving-breakers, Model 25 for hex $1\frac{1}{4}$ x $6\frac{1}{2}$ " shank points with Thor collar lock.
- 1—10,000 lb. Braden Winch and Drive Assy. w/LM pole derrick.
- 1—CMC high pressure pump, 4", Model H-4 w/Chrysler 6 cyl. engine.
- 1—CMC dual prime pump, 6", Model 90M w/Chrysler 6 cyl. engine.
- 1—Waukesha Multi-fuel 6 cyl. engine, size $4\frac{1}{4}$ x 6, Spec. 145-GS-4C.
- 1—C.H.E. Dual Paver Pump, Mfg. No. 111-AB, equipped with Waukesha 6 cyl., 60 HP engine and V-belt driven $4\frac{1}{4}$ x $5\frac{1}{2}$ single acting triplex road pump, 3" suction, 3" discharge, on four steel wheels.

FRED CARLSON CO.
Decorah, Iowa Phone 191

FOR SALE

1—TD8-400 Modified Tractor Shovel with extra heavy digging bucket, also complete with bulldozer blade for same attachment, 7'3" width. Interchangeable bucket and bulldozer are hydraulically controlled. This machine (new, Sept., 1950) has worked about 100 hrs. Price F.O.B. Utica, \$10,400.00

1—Uster Bulldozer, new, never used. 4-cylinder continental Red Seal Industrial gas engine. 20 drawbar h.p. and 25 belt h.p. Equipped with bulldozer blade. Wide. For quick sale. Price, F.O.B. \$2600.00

JOSEPH J. CERIE
1313 LEEDS ST.
UTICA 3, N. Y.
PH. 2-8429

STEEL SHEET PILING

Available from N. Y. stock
Will also roll to size and
specifications

LARSEN PILING CORP.
21 West St., New York 6, N. Y.
Phone: HA 2-2280

FOR SALE

2 WOOLDRIDGE SCRAPERS
TCN 18 cubic yards
REASONABLE

CHICAGO HEIGHTS
COAL CO.

27 E. 19th Place
CHICAGO HEIGHTS, ILL.
Phone Chicago Heights 90

USED EQUIPMENT

1—ADNUM Paver. Excellent Condition. Shipped factory Nov. 1948. Electric Screen, oil extensions and attachments.
 1—Model 65 JAEGER mixer power charge gasoline engine driven. Good condition.
 1—BYERS 1½ yd. Backhoe, crane, skimmer, gasoline engine driven. Good condition.
 1—Used 3 yd. truck mixer complete with gasoline engine drive.
 2—Used 3 yd. Truck mixers complete with gasoline engine drive and mounted on Trucks.
 1—2' x 6' three deck vibrating screen complete less drive and motor.
 1—1938 Reo Truck with one-way plow and power winch.
 1—12-ton Low Bed Trailer with electric brakes, fifth wheel. First class rubber.

HOOPER EQUIPMENT INC.

1256 S. State St. Syracuse, N. Y.
 Phone: 4-3244

FOR SALE

45 ton G. E. diesel elec. locomotive
 15 ton Davenport diesel locomotive
 25 ton Browning loco crane new 1942
 Two 50 ton gantry cranes
 110 HP American 3 drum gasoline hoist
 1½ Blaw-Knox clamshell buckets new
 8½ x 10 Clyde 3 drum steam hoists new
 ¾ yd. Bucyrus 20-B diesel crane
 5 new International T-D-24 tractors

MISSISSIPPI VALLEY EQUIPMENT CO.

515 Locust St. St. Louis 1, Mo.

WE WANT TO BUY HYSTER AND CARCO TOWING WINCHES

SEND COMPLETE DETAILS

NATIONWIDE SUPPLY CO.
RAPID CITY, SOUTH DAKOTA

TEL. 204 & 2034
 ASK FOR STEVE MORRISSEY

FOR SALE

¾ yd. Northwest Crane, Model 25, 40' Boom, 28" Cats, Diesel Engine, Rudamatic Tagline, operated 1800 hrs.—New Condition.

\$13,000.00

GLAZER BROS.
ANDERSON, INDIANA

FOR SALE

Bucyrus-Erie 54 B High Lift Shovel Serial No. 33238 Condition Perfect. Boom Length 45' Stick 32' Bucket 2 Cu. Yd. Call or Write

Grove City Construction Co.
 Box 186 Harrisville, Pa. Phone 579

SPECIAL OFFERING!!

GENUINE

CATERPILLAR PARTS

Approximately 50 Tons
 To Be Sold As

ONE LOT

Discounts Range Up To

80%

Pacific Tractor & Equipment Corporation, Dept. LR

9798 E. Marginal Way
 SEATTLE 8, WASHINGTON
 Phone LANDER 7200

FOR SALE

BUCYRUS-ERIE 10B Shovel, 2 years old, serial No. 59165, backhoe, shovel-front and crane-boom attachments.

4—4 TRAXCAVATOR, 2 years old with 2,000 hours, equipped with 1 yd. bucket.

1950 CHEV. 2 ton dump less than 8,000 miles.

1940 INT. 2½ ton 4 yd. dump body.

1941 CHEV. 1½ ton dump.

2—C P drills—56 pounds.

1—C P pavement breaker.

Chicago Pneumatic 210 CFM 315 Caterpillar diesel, less than 700 hrs., mounted on 1947 Dodge truck.

1—Blue Brute pavement breaker.

2—Air tampers.

250 ft. % in. airhose.

ARMSTRONG BROS.

R. D. No. 1 Willow Street, Pa.
 Phone: Lancaster 31152 Evenings.

FOR SALE

3—D-18's S.M. BR9256 to 1H5991 with DOPCU's.
 2—F.P. LeTourneau Scrapers.

1—L.P. LeTourneau Scraper.
 1—T-100 Tandem T-100 Tandem improvements. Completely overhauled. New 5th wheel and reinforced pedestal. S.N.T.B.—30004—E16-H.

2—Tamping D.D. Rollers.

1—UTI Minneapolis-Moline Tractor, 1948.
 25' 10" L. G. C. Tandem Tandem: International.
 GI 2½ ton Gas Tractor. Fuel Transport—like new—2,000 gal. capacity.

All equipment A-1 shape inside and out. Including rubber, nuts, rollers and shafts.

H. VAN DE RIET & SONS
 Raymond, Minn. Phone 40L

We Own and Offer For Sale

Modern
 Construction Equipment
 Immediate Delivery
 Excellent Condition

Scrapers

7 LeTourneau LP - 12 yd.
 1 LeTourneau SU - 12 yd.
 3 Woodridge 88U - 12 yd.
 33 LeTourneau LS - 8 yd.
 5 Woodridge 88S - 9 yd.
 2 Garwood 511 - 10 yd.
 6 Daniel 811 - 9 yd.

Tractors

5 Caterpillar D8 6 Allis-Chalmers
 7 Caterpillar D7 HD10
 2 Caterpillar D4

Cranes, Draglines, Shovels, Backhoes

4 Bucyrus Erie 158 Draglines - ½ yd.
 3 Inlay K 12 Cranes - ½ yd.
 1 Keystone 18A Crane - 1 yd.
 1 P & H 150 Dragline - ½ yd.
 1 Bay City 15A Truckcrane - ½ yd.
 3 Inlay K12 Backhoes - ½ yd.
 1 Byers 83 Shovel - ½ yd.
 1 Lima 34 Dragline - ½ yd.
 2 NW80D Barge Mount Cranes - 2½ yd.
 1 Link Belt MS70 Cruiser Crane - ½ yd.

Miscellaneous

3 EC31 Atthey Dump Trailers
 3 Caterpillar 12 Motor Graders
 2 FC 31 Atthey Dump Trailers
 5 Galion 101 Motor Graders
 Clamshell & Dragline Buckets
 Shovel Fronts for NW 25 & NW 4

HYMAN-MICHAELS CO.

122 S. Michigan Ave. Wabash 2-4911
 CHICAGO, ILLINOIS

2300 Jerrold Ave. Mission 3-3631
 SAN FRANCISCO, CALIFORNIA

4631 E. Sheila St. Angeles 1-8118
 LOS ANGELES, CALIFORNIA

CRANES

½ and ¾

Inleys—Lorains—Byers—Units—
 Quickway—Osgood—P. & H.—
 Hansen—Lima—NW 25

(As is) or reconditioned.

¾ to 2 Cu. Yd.—
 Drag & Clamshell Buckets
 Wrecking 1000 GI Trucks

THE ELLIS COMPANY

(Formerly Ellis-Neveck Company)
 2510 W. Empire St. Burbank, Calif.
 805-261-7206

FOR SALE

1—1949 D-4 Caterpillar tractor equipped with IT-4 Traxcavator. 2000 hours on tractor; unit like new; owner going to army and forced to sell.

C. B. SHEPARD
 HUMBOLDT, KANSAS

CLEARING HOUSE

IMMEDIATE DELIVERY

- 1—Allis-Chalmers Model HD7W tractor w/ Gar Wood bulldozer.
- 1—Allis-Chalmers Model B tractor with mower.
- 1—"Caterpillar" Model 212 motor grader.
- 1—Gar Wood Model 508 scraper.
- 1—P & H Model WN300 portable welder.
- 1—P & H Model WN200 portable welder.
- 1—Bros Model SG-55 skid mounted steam generator.
- 1—LeTourneau Model F scraper, 13-15 yd. Very good.
- 1—Warco motor patrol w/ International Diesel engine. Very clean.
- 1—Buckeye Model #1 Ditcher.
- 1—Allis-Chalmers HD7W and Gar Wood hyd. angle dozer.
- 2—Allis-Chalmers Model HD10W w/ Gar Wood Hyd. bulldozers.
- 1—Allis-Chalmers Model HD10W w/ Buckeye bulldozer & Gar Wood DDCU.
- 3 cu yd. 2 wheel Gar Wood hydraulic scraper. Like new.
- LeTourneau 3 1/2 cu. yd. scraper. Very clean.
- 1—Slightly used 1949 Mack Model E.H. T. demonstrator. Very good discount. Equipped with Tulsa winch, less fifth wheel.
- 1—Novo traffic line marker.
- 1—Gardner-Denver Model 105 portable air compressor.
- 1—Titan chain saw.

ILLINOIS ROAD EQUIPMENT COMPANY

1310 E. Jefferson St.
SPRINGFIELD, ILL.
Phone 2-7709

CATERPILLAR D50 USED DIESEL CRAWLER TRACTOR With

LaPlante Choker Hydraulic Ball Doser For Quick Sale—\$2750—F.O.B. Chicago
MUTUAL TRUCK PARTS CO., INC.
2000 S. Wabash Avenue, Chicago 16, Ill.
Calumet 5-1500

DEPENDABLE USED MACHINES

Lorain 40 shovel and drag
Ditcher, 10 ft. wide
Plow 10x36 crawler
Galion Junior patrol grader
Badger Model 283 ditcher
Mack 10 ft. wide crawler
TRACTOR & EQUIPMENT CO.
10032 Southwest Highway, Oak Lawn, Ill.

FOR SALE

White 6 x 4 Cummins Diesel.
Dodge 1 1/2 ton dump truck.
12 to 15 ton low bed machinery trailer.
42" plow steel cable.
Power winches, single and double drum.
MEYERS TRUCK CO.
16th St. Viaduct Milwaukee 3, Wis.

IOWA

Two Unit Crushing & Screening Plant. Near New Condition. Purchased 1949. Primary Unit Model BBB 15 x 36 Jaw. 4' x 10' DD Screen. 40' x 30' field conveyor with 5 yard shovel loading hopper. Powered with Caterpillar D-8800 Engine. 900 x 20 Rubber Tired Chassis, with front dolly, air brakes.

Secondary Unit Model CC, 40' x 24" Rolls. 4' x 12' DD Screen. 30" Belts. Caterpillar D-17000 Engine. 900 x 20 Rubber Tired Chassis. Air Brakes.

This Plant has seen little service and is "Like New." Now operating but can be released before July 1st.

New Cost Approximately \$95,000.00. Our Special low Price, \$57,750.00.

3 Very Excellent Caterpillar DW-10s, with W-10 Wagons. Tires Excellent. Machines new 1948. Motors overhauled. Price each—\$9,750.00.

IF YOU HAVE A HYSTER OR CARCO REAR MOUNT TOWING WINCH FOR SALE, SEND US FULL DETAILS.

NATIONWIDE SUPPLY COMPANY

RAPID CITY - SOUTH DAKOTA
Phone 204. Box 547.

We do a Nation-Wide business in
STEEL SHEET PILING

New and Used Rented and Sold

139 pds. 60 ft. Corn. MI 11—Chicago
62 pds. 53-50 ft. Inland 127—DW
400 pds. 50x45 ft. Z section—Florida
700 pds. 45x40 ft. Both. DP2—New York
204 pds. 20 ft. Corn. MI 15—Illinois

Other lengths and sections at various locations
All sizes Vulcan & McKernan Pile Hammers & Extractors for Rent and Sale—Shop Rebuilt
Regardless of location of your job, wire or write

MISSISSIPPI VALLEY EQUIPMENT CO.

515 Locust St., St. Louis, Mo.
"WE BUY STEEL PILING FOR CASH"

FOR SALE

Factory New DW-10 Cat. with Athey side dump trailer. Less than list price.

CRUSHORN EQUIP. & SUPPLY CO.
Ph. 684 HARLAN, KY.

FOR SALE

1 Fire Truck, Seagrave 500-Gal. Pumper. Good Condition ... \$8000.00

Box No. 95 Perkasie, Pa.
or Phone Perkasie 2081

FOR SALE

I—Buda Model HBD Earth Drill for truck mounting with 16" helix, 6' depth, in excellent condition.

BROOKS EQUIPMENT & MFG. CO.

2018 DAVENPORT ROAD
KNOXVILLE, TENNESSEE

TOURNAPULLS AVAILABLE

Three super C Tournapulls with LP Scrapers and Cummins engines 21-000x24 tires driving 18-00x24 on scraper. Serial numbers C373984, C373987, C374497 new in 1945, used less than 6000 hours. In good running condition.

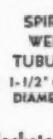
\$7500.00 each

Contact

The Geo. F. Smith Co.
5215 Manchester Ave.
Phone: HIland 9226 St. Louis, Mo.

AUGERS of every description

TWISTED STEEL
1-1/4" to 3 DIAMETERS

SPRAL WELD TUBULAR
1-1/2" to 54" DIAMETERS


Shanks and Sockets
to meet your specifications

THE SALEM TOOL CO.
797 Ellsworth Ave., Salem, Ohio

FOR SALE

1—St. Paul dump box 7 ft. by 9 ft. 5-yard water line.

1—St. Paul dump box 7 ft. by 8 ft. 5-yard water line. Both good as new and priced right.

1—New fuel oil tank, 8 ft. by 20 ft., 6000-gal. cap. No coil or insulation. Price \$825.00 F.O.B.

PIONEER SAND & GRAVEL CO.
Rice Lake, Wisconsin

FOR SALE

H&B Moto-Paver, Serial No. 169, complete with transfer pump, 13' paving width, used 30 days as demonstrator only. Unit is in practically new condition.

CALL - WRITE - WIRE

The George T. Ryan Company
171 27th Avenue S.E.
MINNEAPOLIS, MINNESOTA
Gladstone 7981 Nester 2682

EXCEPTIONAL BUYS

One Waukesha 6AB Power Plant, 90 HP, continuous rating.
 One 165 HP Cummins Powered 1949 KB-11 International tractor, ideal for pulling Lowboy.
 One 150 HP Cummins powered, 1949 Ward-LaFrance.
 One 150 HP Cummins Diesel (not rebuilt).
 One 165 HP rebuilt Cummins Diesel for truck or power unit.

CUMMINS DIESEL SALES CORPORATION

595 Aldine, St. Paul, Minn.
 Phone: NE 7196
 1800 Third Ave. E.
 Hibbing, Minn.
 Phone: 2828

LORAIN Power Crane, Model 75-A, 1½ yd., Serial No. 3734, powered by Waukesha Gasoline Engine WS-40, Serial No. 142375. Equipped with 45 Ft. 2 piece Boom and Rudomatic Tailgate. Recently rebuilt.
 Price \$6,500.00

ROGERS Trailer, 3½ Ton, Model D-35-32, Serial No. 35060. Full Trailer with removable doily, so can be used as semi-trailer. 18 Pneumatic Tires, rear, 8.25 x 25, 4 Pneumatic Tires on doily, 11-90 x 24. New in 1948.
 Price \$5,300.00

Offered subject to prior sale.
SEWARD S. WELLS CO.
 132 Wellington Road
 Buffalo 16, N. Y.

FOR SALE

1—Galion Diesel Motor patrol, Model 101
 1—Diesel 40 "Caterpillar" tractor with LeTourneau bulldozer.
 1—Lorain shovel, Model 75A, 1½ cu. yd. capacity.

W. J. SHEPPARD & CO.

1412 Altgeld St.
 CHICAGO, ILLINOIS
 Ph. Wellington 5-2900

FOR SALE

4000 ft. Used Forms, 10" with 8" Base 10 ft. long.

Chicago Heights Coal Co.
 27 E. 19th Place

Chicago Heights, Illinois
 Telephone: Chicago Heights 90

FOR SALE

BUYERS-ERIE Model 38-B Dragline. Caterpillar D-13,000, 60' Boom, 2 Yd. Hendrix Bucket—3 years old. Excellent condition.

Priester Machinery Company
 Memphis, Tennessee—Ph. 5-6886

TRUCK MIXERS FOR SALE USED

JAEGER 3-yard, 2-compartment, water tanks. Model 3HM-C. Used less than a year. This machine is clean and painted white.
SMITH-MOBILE 2-yard with flush tank. Model 382-B. Engine like new.

Phone, wire or write

REPUBLIC POWER & EQUIPMENT CO.

Al Johnson and Ken Johnson
 Decorah, Iowa Phone 309

Equipment Values!

TRACTOR-DOZER—Caterpillar Diesel D4, 60" ga., #278124W, w/LeTourneau Tilt dozer, Hyter towing winch, aux. drum, A-1 shape, cleaned, painted. FOB Louisville \$3250.00

POWER UNIT—Caterpillar Diesel D8800, #284594, 90 HP, 1100 rpm. Ready for toughest jobs. FOB Louisville \$3775.00

TRAXCATOR—Caterpillar Diesel D4, 274077, equipped with 15" Rat shoes, starter, lighting system. 1949 model, with 600 hours on the hourmeter. FOB Louisville \$5500.00

SCRAPER—LeTourneau Model FP, #75579YR13H, 18 yd., w/two rear and four front tires, good condition. Cleaned, painted, ready to go. FOB Louisville \$4850.00

MOTOR GRADER—Caterpillar Diesel #12, serial #9639, with scarifier and cab. Put in good shape by our shop, resembles a new machine. FOB Louisville \$7850.00

TRACTOR-DOZER—Caterpillar Diesel D8, #8898U, w/LeTourneau angledozer, LeTourneau CGU. Good operating condition. FOB Louisville \$11,000.00

ROY C.
WHAYNE
 SUPPLY CO
 800 W. MAIN ST., LOUISVILLE, KY

FOR SALE
 BARBER-GREENE
 GRADATION CONTROL UNIT

Model 836

Also Warren Bros. Dryer 56" x 25 ft.

Write: Box 1066, Roads and Streets,
 22 W. Maple St., Chicago 10, Ill.

FOR RENT

Motor Truck Cranes 20 ton capacity
 2—Bay City—1—Lorain
 100 foot boom—15 foot jib
 Semi Trucks—Winch trucks
 Derrick trucks—Low Boy trailers
 Air Compressors—Portable Welders

L. I. Griffin & Sons, Inc.

5002 South Hanna St.
 Fort Wayne, Indiana
 Phone H-3295

Pile Driving Equipment

Vulcan and McKinnon-Terry

Steam Pile Hammers and Extractors

Pile Driving Accessories

Drop Pile Hammers and Caps

Steel Sheet Piling

CONTRACTORS MACHINERY Co.

2451 Southwest Blvd. Kansas City 8, Mo.
 Phone Valentine 4748

FOR SALE USED

Pumpcrete Equipment

1 Rex—Model 190 Single Pumpcrete Machine 25 cy hr
 1 Rex—Model 190 Double Pumpcrete Machine 35 cy hr with 2000 feet of 7" pipe. Located at Lake Charles, La. In first class condition. Reasonable.

Walter L. Couse & Co. VERNON B-0660
 12740 Lyndon Ave. Detroit 27, Michigan

N.W. Model 6 Shovels—Link Belt No. 579 44-B
 Others
 12-18 Yd. End Dump Euclid—3-27D End Dump Euclid—20D End Dump Euclid—1½ yd. bottom Dump—9-29 Yd. Euclid Bottom Dump Trucks—12-29 Yd. Bottom Dump Euclid without Tractor.

12-18 Yd. Crushers—40" x 18"—12" x 16"—22" x 30"—24" x 30"—30" x 12"—30" x 10"—Symons Cone 5½" x 18"—5" x 15"—5" x 12"—5" x 10"—Dixie Hammer Mill—14" Newhouse Gyr. & 4" Traylor—14" McCly—49" Gyro-crusher—Mobile Hammer Mill.

Roll Crushers—Rod Mill—Ball Mill—Rotary Knes—Drivers 10"x6" others—Feeders—Classifiers—Tuggers—Mine Hoists—Motors—Transformers 180 KVA—225 KVA—230 KVA—250 KVA—275 KVA—300 KVA—325 KVA—350 KVA—375 KVA—400 KVA—425 KVA—450 KVA—475 KVA—500 KVA—525 KVA—550 KVA—575 KVA—600 KVA—625 KVA—650 KVA—675 KVA—700 KVA—725 KVA—750 KVA—775 KVA—800 KVA—825 KVA—850 KVA—875 KVA—900 KVA—925 KVA—950 KVA—975 KVA—1000 KVA—1025 KVA—1050 KVA—1075 KVA—1100 KVA—1125 KVA—1150 KVA—1175 KVA—1200 KVA—1225 KVA—1250 KVA—1275 KVA—1300 KVA—1325 KVA—1350 KVA—1375 KVA—1400 KVA—1425 KVA—1450 KVA—1475 KVA—1500 KVA—1525 KVA—1550 KVA—1575 KVA—1600 KVA—1625 KVA—1650 KVA—1675 KVA—1700 KVA—1725 KVA—1750 KVA—1775 KVA—1800 KVA—1825 KVA—1850 KVA—1875 KVA—1900 KVA—1925 KVA—1950 KVA—1975 KVA—2000 KVA—2025 KVA—2050 KVA—2075 KVA—2100 KVA—2125 KVA—2150 KVA—2175 KVA—2200 KVA—2225 KVA—2250 KVA—2275 KVA—2300 KVA—2325 KVA—2350 KVA—2375 KVA—2400 KVA—2425 KVA—2450 KVA—2475 KVA—2500 KVA—2525 KVA—2550 KVA—2575 KVA—2600 KVA—2625 KVA—2650 KVA—2675 KVA—2700 KVA—2725 KVA—2750 KVA—2775 KVA—2800 KVA—2825 KVA—2850 KVA—2875 KVA—2900 KVA—2925 KVA—2950 KVA—2975 KVA—3000 KVA—3025 KVA—3050 KVA—3075 KVA—3100 KVA—3125 KVA—3150 KVA—3175 KVA—3200 KVA—3225 KVA—3250 KVA—3275 KVA—3300 KVA—3325 KVA—3350 KVA—3375 KVA—3400 KVA—3425 KVA—3450 KVA—3475 KVA—3500 KVA—3525 KVA—3550 KVA—3575 KVA—3600 KVA—3625 KVA—3650 KVA—3675 KVA—3700 KVA—3725 KVA—3750 KVA—3775 KVA—3800 KVA—3825 KVA—3850 KVA—3875 KVA—3900 KVA—3925 KVA—3950 KVA—3975 KVA—4000 KVA—4025 KVA—4050 KVA—4075 KVA—4100 KVA—4125 KVA—4150 KVA—4175 KVA—4200 KVA—4225 KVA—4250 KVA—4275 KVA—4300 KVA—4325 KVA—4350 KVA—4375 KVA—4400 KVA—4425 KVA—4450 KVA—4475 KVA—4500 KVA—4525 KVA—4550 KVA—4575 KVA—4600 KVA—4625 KVA—4650 KVA—4675 KVA—4700 KVA—4725 KVA—4750 KVA—4775 KVA—4800 KVA—4825 KVA—4850 KVA—4875 KVA—4900 KVA—4925 KVA—4950 KVA—4975 KVA—5000 KVA—5025 KVA—5050 KVA—5075 KVA—5100 KVA—5125 KVA—5150 KVA—5175 KVA—5200 KVA—5225 KVA—5250 KVA—5275 KVA—5300 KVA—5325 KVA—5350 KVA—5375 KVA—5400 KVA—5425 KVA—5450 KVA—5475 KVA—5500 KVA—5525 KVA—5550 KVA—5575 KVA—5600 KVA—5625 KVA—5650 KVA—5675 KVA—5700 KVA—5725 KVA—5750 KVA—5775 KVA—5800 KVA—5825 KVA—5850 KVA—5875 KVA—5900 KVA—5925 KVA—5950 KVA—5975 KVA—6000 KVA—6025 KVA—6050 KVA—6075 KVA—6100 KVA—6125 KVA—6150 KVA—6175 KVA—6200 KVA—6225 KVA—6250 KVA—6275 KVA—6300 KVA—6325 KVA—6350 KVA—6375 KVA—6400 KVA—6425 KVA—6450 KVA—6475 KVA—6500 KVA—6525 KVA—6550 KVA—6575 KVA—6600 KVA—6625 KVA—6650 KVA—6675 KVA—6700 KVA—6725 KVA—6750 KVA—6775 KVA—6800 KVA—6825 KVA—6850 KVA—6875 KVA—6900 KVA—6925 KVA—6950 KVA—6975 KVA—7000 KVA—7025 KVA—7050 KVA—7075 KVA—7100 KVA—7125 KVA—7150 KVA—7175 KVA—7200 KVA—7225 KVA—7250 KVA—7275 KVA—7300 KVA—7325 KVA—7350 KVA—7375 KVA—7400 KVA—7425 KVA—7450 KVA—7475 KVA—7500 KVA—7525 KVA—7550 KVA—7575 KVA—7600 KVA—7625 KVA—7650 KVA—7675 KVA—7700 KVA—7725 KVA—7750 KVA—7775 KVA—7800 KVA—7825 KVA—7850 KVA—7875 KVA—7900 KVA—7925 KVA—7950 KVA—7975 KVA—8000 KVA—8025 KVA—8050 KVA—8075 KVA—8100 KVA—8125 KVA—8150 KVA—8175 KVA—8200 KVA—8225 KVA—8250 KVA—8275 KVA—8300 KVA—8325 KVA—8350 KVA—8375 KVA—8400 KVA—8425 KVA—8450 KVA—8475 KVA—8500 KVA—8525 KVA—8550 KVA—8575 KVA—8600 KVA—8625 KVA—8650 KVA—8675 KVA—8700 KVA—8725 KVA—8750 KVA—8775 KVA—8800 KVA—8825 KVA—8850 KVA—8875 KVA—8900 KVA—8925 KVA—8950 KVA—8975 KVA—9000 KVA—9025 KVA—9050 KVA—9075 KVA—9100 KVA—9125 KVA—9150 KVA—9175 KVA—9200 KVA—9225 KVA—9250 KVA—9275 KVA—9300 KVA—9325 KVA—9350 KVA—9375 KVA—9400 KVA—9425 KVA—9450 KVA—9475 KVA—9500 KVA—9525 KVA—9550 KVA—9575 KVA—9600 KVA—9625 KVA—9650 KVA—9675 KVA—9700 KVA—9725 KVA—9750 KVA—9775 KVA—9800 KVA—9825 KVA—9850 KVA—9875 KVA—9900 KVA—9925 KVA—9950 KVA—9975 KVA—10000 KVA—10025 KVA—10050 KVA—10075 KVA—10100 KVA—10125 KVA—10150 KVA—10175 KVA—10200 KVA—10225 KVA—10250 KVA—10275 KVA—10300 KVA—10325 KVA—10350 KVA—10375 KVA—10400 KVA—10425 KVA—10450 KVA—10475 KVA—10500 KVA—10525 KVA—10550 KVA—10575 KVA—10600 KVA—10625 KVA—10650 KVA—10675 KVA—10700 KVA—10725 KVA—10750 KVA—10775 KVA—10800 KVA—10825 KVA—10850 KVA—10875 KVA—10900 KVA—10925 KVA—10950 KVA—10975 KVA—11000 KVA—11025 KVA—11050 KVA—11075 KVA—11100 KVA—11125 KVA—11150 KVA—11175 KVA—11200 KVA—11225 KVA—11250 KVA—11275 KVA—11300 KVA—11325 KVA—11350 KVA—11375 KVA—11400 KVA—11425 KVA—11450 KVA—11475 KVA—11500 KVA—11525 KVA—11550 KVA—11575 KVA—11600 KVA—11625 KVA—11650 KVA—11675 KVA—11700 KVA—11725 KVA—11750 KVA—11775 KVA—11800 KVA—11825 KVA—11850 KVA—11875 KVA—11900 KVA—11925 KVA—11950 KVA—11975 KVA—12000 KVA—12025 KVA—12050 KVA—12075 KVA—12100 KVA—12125 KVA—12150 KVA—12175 KVA—12200 KVA—12225 KVA—12250 KVA—12275 KVA—12300 KVA—12325 KVA—12350 KVA—12375 KVA—12400 KVA—12425 KVA—12450 KVA—12475 KVA—12500 KVA—12525 KVA—12550 KVA—12575 KVA—12600 KVA—12625 KVA—12650 KVA—12675 KVA—12700 KVA—12725 KVA—12750 KVA—12775 KVA—12800 KVA—12825 KVA—12850 KVA—12875 KVA—12900 KVA—12925 KVA—12950 KVA—12975 KVA—13000 KVA—13025 KVA—13050 KVA—13075 KVA—13100 KVA—13125 KVA—13150 KVA—13175 KVA—13200 KVA—13225 KVA—13250 KVA—13275 KVA—13300 KVA—13325 KVA—13350 KVA—13375 KVA—13400 KVA—13425 KVA—13450 KVA—13475 KVA—13500 KVA—13525 KVA—13550 KVA—13575 KVA—13600 KVA—13625 KVA—13650 KVA—13675 KVA—13700 KVA—13725 KVA—13750 KVA—13775 KVA—13800 KVA—13825 KVA—13850 KVA—13875 KVA—13900 KVA—13925 KVA—13950 KVA—13975 KVA—14000 KVA—14025 KVA—14050 KVA—14075 KVA—14100 KVA—14125 KVA—14150 KVA—14175 KVA—14200 KVA—14225 KVA—14250 KVA—14275 KVA—14300 KVA—14325 KVA—14350 KVA—14375 KVA—14400 KVA—14425 KVA—14450 KVA—14475 KVA—14500 KVA—14525 KVA—14550 KVA—14575 KVA—14600 KVA—14625 KVA—14650 KVA—14675 KVA—14700 KVA—14725 KVA—14750 KVA—14775 KVA—14800 KVA—14825 KVA—14850 KVA—14875 KVA—14900 KVA—14925 KVA—14950 KVA—14975 KVA—15000 KVA—15025 KVA—15050 KVA—15075 KVA—15100 KVA—15125 KVA—15150 KVA—15175 KVA—15200 KVA—15225 KVA—15250 KVA—15275 KVA—15300 KVA—15325 KVA—15350 KVA—15375 KVA—15400 KVA—15425 KVA—15450 KVA—15475 KVA—15500 KVA—15525 KVA—15550 KVA—15575 KVA—15600 KVA—15625 KVA—15650 KVA—15675 KVA—15700 KVA—15725 KVA—15750 KVA—15775 KVA—15800 KVA—15825 KVA—15850 KVA—15875 KVA—15900 KVA—15925 KVA—15950 KVA—15975 KVA—16000 KVA—16025 KVA—16050 KVA—16075 KVA—16100 KVA—16125 KVA—16150 KVA—16175 KVA—16200 KVA—16225 KVA—16250 KVA—16275 KVA—16300 KVA—16325 KVA—16350 KVA—16375 KVA—16400 KVA—16425 KVA—16450 KVA—16475 KVA—16500 KVA—16525 KVA—16550 KVA—16575 KVA—16600 KVA—16625 KVA—16650 KVA—16675 KVA—16700 KVA—16725 KVA—16750 KVA—16775 KVA—16800 KVA—16825 KVA—16850 KVA—16875 KVA—16900 KVA—16925 KVA—16950 KVA—16975 KVA—17000 KVA—17025 KVA—17050 KVA—17075 KVA—17100 KVA—17125 KVA—17150 KVA—17175 KVA—17200 KVA—17225 KVA—17250 KVA—17275 KVA—17300 KVA—17325 KVA—17350 KVA—17375 KVA—17400 KVA—17425 KVA—17450 KVA—17475 KVA—17500 KVA—17525 KVA—17550 KVA—17575 KVA—17600 KVA—17625 KVA—17650 KVA—17675 KVA—17700 KVA—17725 KVA—17750 KVA—17775 KVA—17800 KVA—17825 KVA—17850 KVA—17875 KVA—17900 KVA—17925 KVA—17950 KVA—17975 KVA—18000 KVA—18025 KVA—18050 KVA—18075 KVA—18100 KVA—18125 KVA—18150 KVA—18175 KVA—18200 KVA—18225 KVA—18250 KVA—18275 KVA—18300 KVA—18325 KVA—18350 KVA—18375 KVA—18400 KVA—18425 KVA—18450 KVA—18475 KVA—18500 KVA—18525 KVA—18550 KVA—18575 KVA—18600 KVA—18625 KVA—18650 KVA—18675 KVA—18700 KVA—18725 KVA—18750 KVA—18775 KVA—18800 KVA—18825 KVA—18850 KVA—18875 KVA—18900 KVA—18925 KVA—18950 KVA—18975 KVA—19000 KVA—19025 KVA—19050 KVA—19075 KVA—19100 KVA—19125 KVA—19150 KVA—19175 KVA—19200 KVA—19225 KVA—19250 KVA—19275 KVA—19300 KVA—19325 KVA—19350 KVA—19375 KVA—19400 KVA—19425 KVA—19450 KVA—19475 KVA—19500 KVA—19525 KVA—19550 KVA—19575 KVA—19600 KVA—19625 KVA—19650 KVA—19675 KVA—19700 KVA—19725 KVA—19750 KVA—19775 KVA—19800 KVA—19825 KVA—19850 KVA—19875 KVA—19900 KVA—19925 KVA—19950 KVA—19975 KVA—20000 KVA—20025 KVA—20050 KVA—20075 KVA—20100 KVA—20125 KVA—20150 KVA—20175 KVA—20200 KVA—20225 KVA—20250 KVA—20275 KVA—20300 KVA—20325 KVA—20350 KVA—20375 KVA—20400 KVA—20425 KVA—20450 KVA—20475 KVA—20500 KVA—20525 KVA—20550 KVA—20575 KVA—20600 KVA—20625 KVA—20650 KVA—20675 KVA—20700 KVA—20725 KVA—20750 KVA—20775 KVA—20800 KVA—20825 KVA—20850 KVA—20875 KVA—20900 KVA—20925 KVA—20950 KVA—20975 KVA—21000 KVA—21025 KVA—21050 KVA—21075 KVA—21100 KVA—21125 KVA—21150 KVA—21175 KVA—21200 KVA—21225 KVA—21250 KVA—21275 KVA—21300 KVA—21325 KVA—21350 KVA—21375 KVA—21400 KVA—21425 KVA—21450 KVA—21475 KVA—21500 KVA—21525 KVA—21550 KVA—21575 KVA—21600 KVA—21625 KVA—21650 KVA—21675 KVA—21700 KVA—21725 KVA—21750 KVA—21775 KVA—21800 KVA—21825 KVA—21850 KVA—21875 KVA—21900 KVA—21925 KVA—21950 KVA—21975 KVA—22000 KVA—22025 KVA—22050 KVA—22075 KVA—22100 KVA—22125 KVA—22150 KVA—22175 KVA—22200 KVA—22225 KVA—22250 KVA—22275 KVA—22300 KVA—22325 KVA—22350 KVA—22375 KVA—22400 KVA—22425 KVA—22450 KVA—22475 KVA—22500 KVA—22525 KVA—22550 KVA—22575 KVA—22600 KVA—22625 KVA—22650 KVA—22675 KVA—22700 KVA—22725 KVA—22750 KVA—22775 KVA—22800 KVA—22825 KVA—22850 KVA—22875 KVA—22900 KVA—22925 KVA—22950 KVA—22975 KVA—23000 KVA—23025 KVA—23050 KVA—23075 KVA—23100 KVA—23125 KVA—23150 KVA—23175 KVA—23200 KVA—23225 KVA—23250 KVA—23275 KVA—23300 KVA—23325 KVA—23350 KVA—23375 KVA—23400 KVA—23425 KVA—23450 KVA—23475 KVA—23500 KVA—23525 KVA—23550 KVA—23575 KVA—23600 KVA—23625 KVA—23650 KVA—23675 KVA—23700 KVA—23725 KVA—23750 KVA—23775 KVA—23800 KVA—23825 KVA—23850 KVA—23875 KVA—23900 KVA—23925 KVA—23950 KVA—23975 KVA—24000 KVA—24025 KVA—24050 KVA—24075 KVA—24100 KVA—24125 KVA—24150 KVA—24175 KVA—24200 KVA—24225 KVA—24250 KVA—24275 KVA—24300 KVA—24325 KVA—24350 KVA—24375 KVA—24400 KVA—24425 KVA—24450 KVA—24475 KVA—24500 KVA—24525 KVA—24550 KVA—24575 KVA—24600 KVA—24625 KVA—24650 KVA—24675 KVA—24700 KVA—24725 KVA—24750 KVA—24775 KVA—24800 KVA—24825 KVA—24850 KVA—24875 KVA—24900 KVA—24925 KVA—24950 KVA—24975 KVA—25000 KVA—25025 KVA—25050 KVA—25075 KVA—25100 KVA—25125 KVA—25150 KVA—25175 KVA—25200 KVA—25225 KVA—25250 KVA—25275 KVA—25300 KVA—25325 KVA—25350 KVA—25375 KVA—25400 KVA—25425 KVA—25450 KVA—25475 KVA—25500 KVA—25525 KVA—25550 KVA—25575 KVA—25600 KVA—25625 KVA—25650 KVA—25675 KVA—25700 KVA—25725 KVA—25750 KVA—25775 KVA—25800 KVA—25825 KVA—25850 KVA—25875 KVA—25900 KVA—25925 KVA—25950 KVA—25975 KVA—26000 KVA—26025 KVA—26050 KVA—26075 KVA—26100 KVA—26125 KVA—26150 KVA—26175 KVA—26200 KVA—26225 KVA—26250 KVA—26275 KVA—26300 KVA—26325 KVA—26350 KVA—26375 KVA—26400 KVA—26425 KVA—26450 KVA—26475 KVA—26500 KVA—26525 KVA—26550 KVA—26575 KVA—26600 KVA—26625 KVA—26650 KVA—26675 KVA—26700 KVA—26725 KVA—26750 KVA—26775 KVA—26800 KVA—26825 KVA—26850 KVA—26875 KVA—26900 KVA—26925 KVA—26950 KVA—26975 KVA—27000 KVA—27025 KVA—27050 KVA—27075 KVA—27100 KVA—27125 KVA—27150 KVA—27175 KVA—27200 KVA—27225 KVA—27250 KVA—27275 KVA—27300 KVA—27325 KVA—27350 KVA—27375 KVA—27400 KVA—27425 KVA—27450 KVA—27475 KVA—27500 KVA—27525 KVA—27550 KVA—27575 KVA—27600 KVA—27625 KVA—27650 KVA—27675 KVA—27700 KVA—27725 KVA—27750 KVA—27775 KVA—27800 KVA—27825 KVA—27850 KVA—27875 KVA—27900 KVA—27925 KVA—27950 KVA—27975 KVA—28000 KVA—28025 KVA—28050 KVA—28075 KVA—28100 KVA—28125 KVA—28150 KVA—28175 KVA—28200 KVA—28225 KVA—28250 KVA—28275 KVA—28300 KVA—28325 KVA—28350 KVA—28375 KVA—28400 KVA—28425 KVA—28450 KVA—28475 KVA—28500 KVA—28525 KVA—28550 KVA—28575 KVA—28600 KVA—28625 KVA—28650 KVA—28675 KVA—28700 KVA—28725 KVA

Matchless Value



*"BOSS"

Washer type female coupling

Style W-16

Users of this long-time leader in the Dixon line represent a roster of American industry. Its quality and design distinguish it from others frequently yet improperly classified as "Boss type couplings."

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.

Reg. U. S. Pat. Off.

DIXON
VALVE & COUPLING CO.

Main Office and Factory: PHILADELPHIA, PA.
BRANCHES: CHICAGO BIRMINGHAM LOS ANGELES HOUSTON

INDEX TO ADVERTISERS

Acker Drill Company	108	Link-Belt Speeder Corp.	27
Adams, Bernan	112	Littiford Bros.	73
*Adams Mfg. Co., J. D.	25	Lull Manufacturing Co.	95
Aggregates Equipment Co., Inc.	117	McCarter Iron Works, Inc.	77
Allis-Chalmers	20-21	McConaughay, K. E.	78
American Cable Div. (American Chain & Cable Co.)	33	McElwain, Keith	117
Anderson Equipment Co., Inc.	111	McLeod, Alex T.	121
Armstrong Bros.	119	Mack Manufacturing Corp.	4
Atkinson Company, Guy F.	113	Mahoney-Clarke, Inc.	117
*Austin-Western Company	16	Marian Metal Products Co.	104
Bakley Brothers	112	Marr, John W.	113
*Barber-Greene Company	62-63	Meyers Truck Co.	120
Bernstein Brothers	117	Michigan Power Shovel Co.	56
*Brittenham Steel Co.	1	Mississippi Valley Equip. Co.	119, 120
Bitulco Products Co.	119	Maria Bros. Machinery Co.	112
*Blaw-Knox Company	119	Marton, Allan	117
Bode-Finn Co., The	119	Mutual Truck Parts Co., Inc.	128
Bourn Equipment Co., GH	115	Nagle-Hart Tractor & Equipment Co.	114
Brown & Root, Inc.	115	Nationwide Supply Co.	119, 120
Boots, J. L.	120	New England Industries, Inc., The	115
Bremer Machinery Co., Inc.	22-23	Northwest Engineering Co.	7
Brooks Equipment & Mfg. Co.	99	Ohio Oil Company	66
Bucyrus-Erie Company	24	Overman Mfg. Co., I. J.	89
*Buffalo-Springfield Roller Co.	111	Pacific Tractor & Equipment Corp.	119
Burns Bros. Co.	114	Paisley-Smith Coal Co.	114
Buy-Rite Truck & Equip. Inc.	110	Park Tractor Co., George	118
Cain, Inc., Fred F.	114	Parson Company	12-13
Campbell, Bruce	110	Pekham Road Corp.	116
Carlson Co., Fred	114	Penn Machinery Co., Inc., N. O.	115
Caterpillar Tractor Co.	114	Pennington-Winter Constr. Co.	114
Cerini, Joseph J.	114	Perfection Steel Body Company	30
Chicago Heights Coal Co.	114	Pioneer Engineering Works, Inc.	70-71
Chippewa Construction Co.	114	Pioneer Sand & Gravel Co.	120
Clark Co., The W. I.	64	Portland Cement Association	28
*Claver-Brooks Co.	116	Priester Machinery Co.	121
Collins & Sons, Inc., William	116	Reed & Prince Chemical Corp.	77
Contractors Machinery Co.	121	Rental Service Co.	114
Couse & Co., Walter L.	116	Republic Power & Equip. Co.	121
Cowhey & Sons, J.	116	Republie Steel Corp.	55
Crown Equipment & Supply Co.	116	Res Trailer Co., Inc.	111
Cummins & Sons, Co., F. D.	116	Richter, Inc., Harry M.	114
Cummins Diesel Sales Corp.	116	Roebing's Sons Co., John A.	58
Cummins Diesel Sales Corp. of Ohio	116	Rogers Bros. Corporation	57
Day & Maddock Co., The	116	Relatape, Inc.	89
Del Bene, John	116	Ryan Company, The George T.	120
Depe Detrol Corp.	116	Saltman Construction Co.	117
Detroit & Allis Technical Co.	116	Santucci Const. Co.	114
Dixie Bros., H. E.	116	Scampi & Sons, Inc.	109
Dixon Valve & Coupling Co.	116	Schultz & Loring Construction Co.	113
Dryden Supply Co., Inc.	116	Seaman Motors, Inc.	97
Eagle Crusher Company	116	Selvage, Donald H.	115
Eaton Mfg. Co. (Aero Div.)	116	Service Equipment Co.	110
Eighty Equipment Co.	116	Shepard, C. B.	119
*Electric Tamer & Equipment Co.	116	Shepard & Co., W. J.	121
Ellis Company, The	116	Shun Mfg. Company	110
Endress & Hauser, E. D.	116	Sindt, Henry	117
Euclid Road Machinery Co., The	116	Smith Co., H. V.	117
Evans and Edell	116	Smith, Co., The Geo. F.	120
Fielding & Shepley, Inc.	116	Stancil Asphalt & Bitumen Co.	55
Firestone Tire & Rubber Co., The	116	Standard Asphalt & Tar Co.	111
First Investment Corp.	116	Strahl Engineering Works	84
Fisher Vendomatic Auto Sales, Bill	116	Swinger Construction Co.	114
Fisher Research Lab., Inc.	116	Texas Co., The	113
*Flexible Read Joint Machine Co.	54	Thomasville Stone & Lime Co.	111
Flintkote Co., The	54	Timber Structures, Inc.	101
Ford Motor Company	31	*Timken Roller Bearing Co.	Front Cover
Forke Bros. & Ficks	116	Tractor & Equipment Co.	20
Foster, Inc., Frank B.	116	Tractors For Export, Inc.	118
Furnival Machinery Co.	116	Troyer, Stanley B.	21
G & S Sales Co.	116	Turner & Sons, E. N.	115
*Galvin Iron Works & Mfg. Co., The	116	Universal Atlas Cement Co.	32
Gibbs-Cook Equipment Co.	116	Van De Riel Bros., H.	119
Glazier Bros.	116	Vulcan Tool Mfg. Co.	110
Glenhill Road Machy, Co., The	116	W. H. W. Machine & Tool Co.	116
Goodrich Company, The B. F.	116	Wasap Sand & Gravel Co.	112
Great Lakes Construction Co.	116	Warner & Swasey Co.	6
Griffith, J. O.	116	Watson Co., Inc., Emmett C.	110
Groves & Sons, L. I.	116	*Wauauan Iron Works, Inc.	103
Griffiths, Clarence J.	116	Wellman Engineering Co., The	105
Grove City Construction Co.	116	Wells Co., Seward S.	121
Groves and Sons Co., B. J.	116	Wenzel Machinery Rental & Sales Co.	116
Harrington Stone Co.	116	Western Contractor Supply Co.	111
*Heltzel Steel Form & Iron Co.	116	Wetherby Construction Co., J. P.	113
Hetherington & Bemer, Inc.	116	Wayne Supply Co., Roy C.	121
Hess, Amedee	116	Wheeler Machinery Co., J. K.	112
Hooper Equipment Inc.	116	*White Mfg. Co.	89
Hopkins Venebrane Specialties, Inc.	116	Wiesner, Otto	115
Horn C. Inc., A. C.	116	Wilensky Auto Parts Co.	118
*Huber Mfg. Co., The	116	Williams Co., The W. W.	115
Hyman-Michels Co.	116	Williams Construction Co.	113
Hyster Company	116	Wilsshire Power Sweeper	113
Industrial Read Equipment Co.	116		
*Ingersoll-Rand Vaneer Co.	5-51		
*Iowa Manufacturing Co.	27-75		
Jasper Machine Co., The	81		
Johnson Company, C. S.	12-13		
Kearney, Crgne & Co.	112		
Kendrick Machinery	116		
Koehring Company	12-13		
Koehring Company, Inc.	61		
Kwik-Mix Company	12-13		
LaPlant-Cheate Mfg. Co.	3		
LeRel Company	14-15		
LeTourneau, Inc., R. G.	118		
Larsen Piling Corp.	119		
Lausen Company, The	119		
Light Products, Inc.	119		

Second Cover

3

14-15

118

119

120

111

112

116

115

116

115

115

116

113

111

112

115

115

116

113

111

112

113

111

112

111

112

111

112

113

111

112

111

112

113

111

112

111

112

111

112

111

112

111

112

111

112

When writing to advertisers please mention ROADS AND STREETS, July, 1951

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

111

112

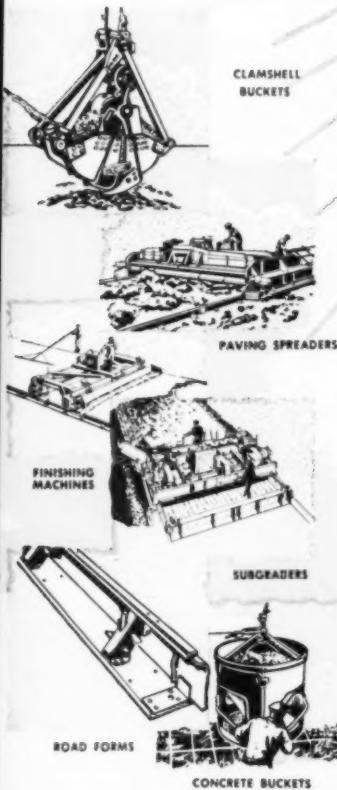
111

112

111

Here's your **BLAW-KNOX** "Complete Package" of concrete construction equipment

To give you all these advantages:



One source for every piece of equipment you need — from forms to finisher.

One undivided responsibility to back up the performance of all your equipment.

One financial arrangement covers the entire "package".

One source for parts and expert mechanical service.

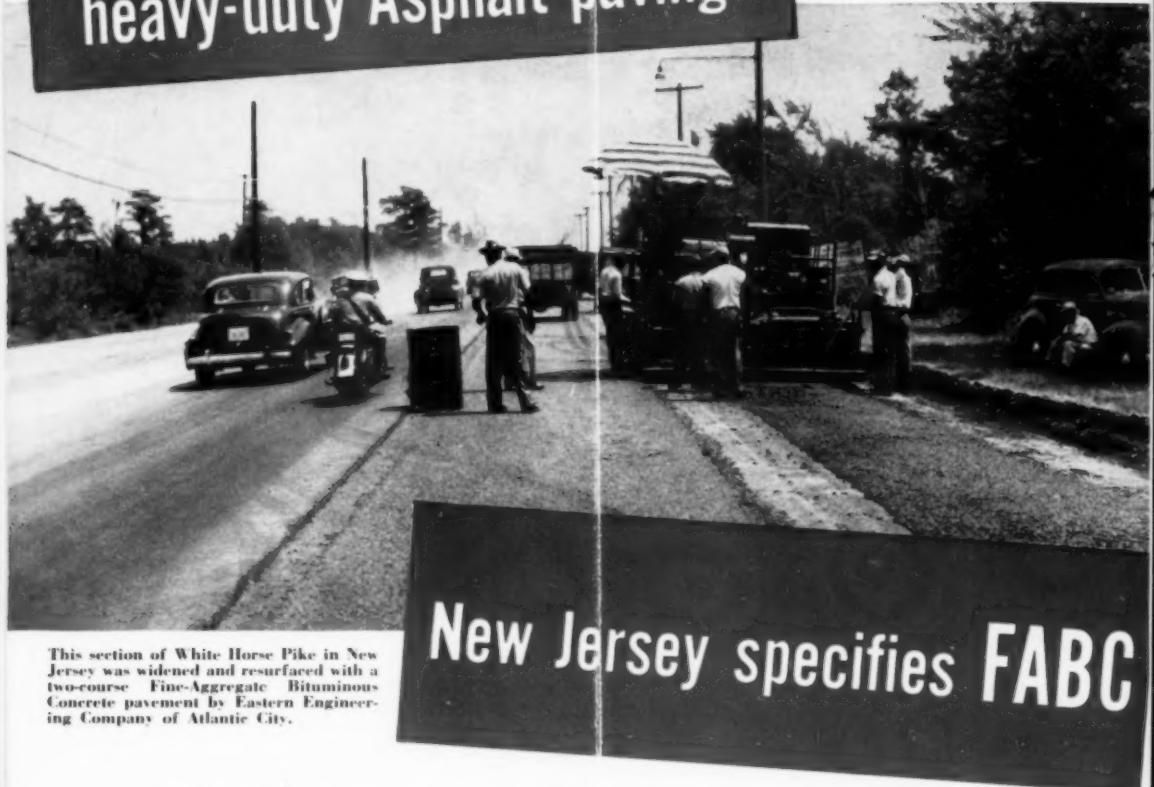
IN ADDITION to these one-source advantages, you get the lower cost operation that comes with 100% mechanized production. There are many other reasons why you get more and save more with the all-way benefits of the two Blaw-Knox "Complete Packages" of matched equipment—one for concrete paving and one for ready-mix concrete. See your Blaw-Knox distributor for complete details.



BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX CO., Farmers Bank Bldg., Pittsburgh 22, Pa.
New York • Chicago • Philadelphia • Birmingham • Washington • San Francisco

When a highway needs heavy-duty Asphalt paving...



This section of White Horse Pike in New Jersey was widened and resurfaced with a two-course Fine-Aggregate Bituminous Concrete pavement by Eastern Engineering Company of Atlantic City.

New Jersey specifies FABC

White Horse Pike is one of New Jersey's busiest east-west highways, linking Camden with Atlantic City, world-famous ocean resort. When a large mileage of the Pike called for resurfacing, the State specified Fine-Aggregate Bituminous Concrete paving, commonly known as FABC. Year after year, this dense, rugged, joint-free type of hot-mix paving has been constructed on important streets and highways throughout the State. Its ability to absorb punishing impact with a minimum of maintenance has become well-established.

A factor which many of New Jersey's FABC projects have had in common through the years has been the use

of Texaco Asphalt as binder in the mix. Produced from selected crudes under skilled supervision by the most modern refining methods, this asphalt has served road builders of New Jersey for more than 10 years. A Texaco-paved street in Newark continues to give satisfactory service after 13 years.

Helpful information on Asphaltic Concrete, as well as the various other types of asphalt construction for roads, streets, and airports, is presented in two illustrated booklets, copies of which may be obtained free by writing our nearest office.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19



TEXACO ASPHALT